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THE RELATIONSHIP BETWEEN THE SIZE OF URBAN SCHOOL SYSTEMS
IN WESTERN CANADA AND CERTAIN CHARACTERISTICS
OF THEIR ADMINISTRATIVE STAFFS

BY



NORMAN GILL

A THESIS

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The undersigned certify that they have read,
and recommend to the Faculty of Graduate Studies for
acceptance, a thesis entitled "The Relationship Between
the Size of Urban School Systems in Western Canada and
Certain Characteristics of Their Administrative Staffs"
submitted by Norman Gill in partial fulfilment of the
requirements for the degree of Master of Education.

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ABSTRACT

Recent studies of industrial and other organizations suggest that, as organizations become larger, the proportion of administrative staff employed in them tends to become smaller. This suggestion appears contrary to opinions expressed in some sociological writings, and possibly, to popular belief as well, it is contrary to the findings of a reported study of Californian school systems. The present study was undertaken with a view to investigating this, and another characteristic of the administrative staff of a number of school systems in Western Canada.

The specific characteristics of the administrative staffs of school systems which were investigated were, first, the relationship between the size of the system and its proportion of administrative staff, and second, the size of the systems at which each administrative staff office began to occur consistently.

Thirty-eight school systems in the four western provinces of Canada provided information for the study. These systems were all relatively free from external control over the appointment of administrators. They usually contained an urban area in their district, and were representative of the larger systems in their respective provinces. Each system supplied a list of its administrative staff, and data on the number of pupils, teachers, and schools present within it.

The administrative staff for each system was categorized and enumerated according to criteria adapted in the study. The size of each system was calculated on the basis of its number of certificated and non-certificated, professional and administrative personnel. The proportion of administrative staff in each system was calculated. Correlations between proportions of administrative staff and size of system were obtained and tested for significance.

The findings of this portion of the study were that there was a significant negative correlation between the size of school systems and the proportion of administrative staff. That is, in the systems of the sample, the larger the size of the school system, the smaller was its proportion of administrative staff.

In the second part of the study, the school systems were arranged in order of size and their administrative staff positions tabulated. For almost every administrative staff position identified in the study, the size of school system at which it began to occur consistently could be established.

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CHAPTER I

THE PROBLEM AND DEFINITION OF TERMS USED

Of the functions of administration in an organization one writer has said:

In all alike there must be management to fix upon purposes, to provide personnel and materials, and to plan for and organize and direct the program of activities. (11, p. 8)

Perhaps in the simplest organizational situations, such as that of three primitives hunting game, the factor of administration appears on first sight to be lacking. Yet even in a group as small, and as immediately related to its purpose as this, it would be possible to point to the presence of administrative functions. Though they would be hidden within the total performance, specific administrative acts such as decision making and co-ordination of efforts would be present.

As organizations become larger, the differentiation of functions within them becomes much more obvious. Brech says that growth of scale brings "organization" out into the open. (3, p. 8) When an activity requires hundreds or thousands of people for its performance, it begins to involve complex calculations, highly technical procedures, detailed planning and careful timing. (11, p. 25) Certain tasks are

thus separated out from the total performance and become a special function, resting in the hands of a specific set of people within the organization.

Blau and Scott say, that as groups which are organized for particular purposes, increase in size, they tend to accept more complex tasks, to act in more complex ways, and concomitantly, to become subject to pressures from within to become more explicitly organized. Thus as organizations become large and complex they require an aspecially elaborate administrative apparatus. (1, p. 7)

This fact has implications for school systems at the present time, since increasing size and complexity appear to be common characteristics among them. Campbell, et al, and Boyan both comment upon the increasing size of school systems, particularly urban systems. They point, also, to the resulting increased numbers and the greater number of tasks of the central administrative staff. (5, p. 85)(10, p. 7) The consensus, then, is that greater numbers and complexity in an organization lead to greater numbers and complexity in its administration.

There is, however, some question about the changes that take place in the structure of organizations as they grow. Boulding, for instance, has expressed belief in a "principle of nonproportional change" by which he understands

the growth of an organization to be a more complex process than that of a simple proportional increase in the size of each of its parts. He suggests not only do proportions of personnel in various parts of organizations change with size, but functions also change. (2, p. 326)

These considerations lead to questions about the nature of administrative staff in school systems. In particular, they raise issues of the way in which the characteristics of administrative staffs vary with the size of the system.

I. THE PROBLEM

Statement of the Problem

The purpose of the present study was to examine the relationship between the size of school systems and certain characteristics of their administrative staffs.

The school systems chosen for the study were urban systems in four provinces of Western Canada. The characteristics of the administrative staffs with which the study was concerned were, first, the ratio between the size of administrative staff and the size of the school system, and second, the size of the school system at which each of the administrative staff offices began to appear consistently, when systems were ranked in increasing order of size. The size of systems was determined by the numbers of personnel in

defined categories.

The problem, therefore, can be stated in two parts, as follows:

1. What is the relationship between the size of a school system and the proportion of its employees engaged in administration?

2. When systems are ranked in order of size, what is the respective size of the system at which each administrative staff office begins to appear consistently?

The Importance of the Study

The study has implications for the organization of school systems. It sought to establish the relationships between the size of school systems and the size and certain characteristics of their administrative staffs, as they exist in parts of Western Canada at the present time. Superintendents may be able to find in it some points of useful comparison as their school systems grow, and as they consider the appointment of additional staff.

From the point of view of knowledge about the structure of organizations, the study may provide additional information on some aspects of organizational growth. Starbuck alludes to the possible significance of this sort of work when he maintains that the provision of additional data on any aspect of organizational growth and development is an important need

of the study of administration at the present time. (13, p.451)

In recent years, as is discussed in Chapter II, there has been a significant number of studies of the growth of organizations. However, these studies have been largely concerned with industry and public institutions, and very little with school systems. In fact, the most recently reported study of school systems in this regard is that of Terrien and Mills in California, in 1955. Terrien and Mills' study, incidentally, showed some disagreement with the findings of studies in other fields.¹

The design of the study is supported partly by the dictum of Blau and Scott, which says that one method of social research,

. . . is by descriptive studies which define and portray the characteristics of the object of research or determine the frequency of various occurrences and examine their association with each other. (1, p. 15)

II. DEFINITION OF TERMS USED

Consideration in the Determination of a Definition of Administrative Staff

In a work which is supported by Campbell et al on this point, Sears distinguishes five different kinds of activity as characteristic of the administrative process, namely,

¹Infra p. 19.

planning, organizing, directing, co-ordinating, and controlling. Administrative staff, then, might be declared to be those who plan, organize, direct, co-ordinate, and control.

In calculating the supervision ratio for the purposes of his study Indik named as supervisors, "those individuals whose functional role mainly involved direct interpersonal supervision and key organizational decision making."¹ He excluded any persons in the organization who were serving mainly clerical functions, or who were concerned directly with production, from the category of supervisor or administrator. (9, p. 311) Those named as supervisors by Indik would be subsumed under Sears' categories of administrative staff.

Terrien and Mills recognized superintendents, their assistants and immediate staff, principals and business managers as making up the administrative component of the school system. They excluded from this component, "teachers, nurses, custodians, cafeteria workers and the like" in a manner which suggests agreement with Indik's definition. (13, p. 12)

Harris' model may help to distinguish administrative from non-administrative staff. Harris examined the categories of functions found within school systems with respect

¹Infra p. 19

to the directness of their relationship to pupils and to instruction. He showed that the teaching function was directly related to both pupils and instruction, whereas the functions of supervision, management, and general administration were not at any stage directly related to pupils, as a major part of their function. (8, p. 12)

This lack of a direct relationship of administrative personnel to pupils is a characteristic which can be added to Indik's definition to justify the exclusion of the school personnel of which Terrien and Mills speak.

Properly applied, these distinctions will also have the effect of excluding people who are shown on central office or administrative staffing lists, but whose work consists mainly of direct relationship with pupils. Guidance officers, visiting teachers, itinerant teachers of various kinds, reading clinicians, and speech therapists can be recognized as persons concerned with an extension of the instructional program with special emphasis on pupils as individuals. Griffiths et al (6, p. 207) speak of the services of these people as being rendered with the goal in mind that each child should be in the best possible condition to make optimum use of his potentialities for growth through the educational program.

The co-ordinators of such services, however, would be included in administrative staff since they have direct

supervisory relationships with people working with pupils towards the achievement of the system's educational program. Difficulties remain, however, in the categorization of administrative staff concerned with business management, building, and other system maintenance aspects of the operation of school systems. Campbell, Corbally, and Ramseyer include these aspects among the tasks which educational administration has to carry out in order to facilitate teaching and learning. They group administrative tasks into the following categories:

1. School-community relationships.
2. Curriculum development.
3. Pupil personnel.
4. Staff personnel.
5. Physical facilities.
6. Finance and business management.
7. Organization and Structure. (5, p. 103)

These writers point clearly to the responsibilities of administrators for the operation and maintenance of school plant, for planning of new buildings and modification of old ones, the objectives being to secure effectiveness and efficiency in the use of plant for both the proper support of the instructional program and the best use of funds. (5, p. 108)

In the area of business management, specific tasks for administrators, inter alia, are the management of expenditures

and the direction of non-teaching personnel. In the case of the latter, there needs to be supervision and appraisal of performance. (5, p. 122) Since these are legitimate areas with which administration may be concerned, the inclusion within the administrative staff of a school system of those officers who hold administrative responsibility for them appears to be justified.

Administrative Staff

Administrative staff personnel, then, undertake a variety of tasks. They may be distinguished by the fact that their main tasks do not lie in a direct relationship with pupils, and that they undertake one of the following tasks:

1. The planning, organizing, directing, co-ordinating, and/or controlling the activities and personnel of the school system.

2. The making of key organizational decisions.

3. The supervision of the work of other personnel.

In the present study, personnel who met these criteria were categorized as administrative staff. It should be noted that the total administrative staff is made up of two groups of personnel, namely, (a) central office administrative staff, that is, those persons employed in administrative tasks, as defined above, in the central office of the system, and (b) the principals of schools.

For the purpose of the study, no note has been taken of the administrative functions performed by personnel other than principals, on school staffs. Offices such as those of vice principal, department head, or chief custodian were omitted from consideration for several reasons. Previous research gave no indication of having taken these offices into account, so that for the sake of comparison, they were not enumerated in the present study. The roles of persons occupying such offices in schools are not defined in the literature, so that there was insufficient theoretical justification for including them in the administrative staff. School systems, when asked to name the offices of their administrative staffs, made little mention of any office in schools below that of principal.

Size of School System

The size of the school system was obtained by adding together the numbers of personnel employed by the system in the following categories:

- (a) all certificated personnel, including principals, employed as members of school staffs,
- (b) all personnel identified as administrative staff, and employed directly from or by the central office of the school system,
- (c) all personnel who were employed from or by the

central office in professional tasks, but who were not categorized as administrative staff.

Thus the size of the school system was calculated as the total of professional and administrative personnel employed either in schools or in the central office. Personnel who were listed on staffing returns, but who could not be categorized as teachers, professional employees, or administrative staff were excluded. That is, clerical, custodial and cafeteria staffs, and staffs of such sections as transport, stores, equipment, drawing office and maintenance, were omitted.

This method of defining the size of the school system was similar to that used by Terrien and Mills in their study of California school systems.

Consistent Occurrence of an Administrative Office

When school systems are ranked in order of size from smallest to largest, an office is said to occur consistently, if, above a certain size of system, it appears in at least fifty per cent of cases.

Threshold

The threshold, or threshold size, is the size of the system at which an administrative office begins to appear consistently, when systems are ranked in order of size from smallest to largest.

Urban School Systems

Because of the complexity and variation of organization found in the school systems of the four western provinces, no precise definition of the term 'urban school system' is attempted. The term was included in the title of the study to indicate that a sample of school systems was used in the study. These systems included a town or city in their area of jurisdiction, although, in some cases, extensive rural areas were served in addition to the urban centres.

III. ORGANIZATION OF THE STUDY

This chapter has been concerned with the statement of the problem and the sub-problems derived from it. The importance of the study has also been discussed and essential terms have been defined. In Chapter II literature related to the present study is reviewed and hypotheses are proposed. The samples of school systems on which the study was based and the research procedures used, are described in Chapter III. Analyses of data are presented in Chapters IV and V. Chapter IV shows the correlations between the variables of the first sub-problem. Chapter V contains an examination of the way in which the occurrence of the various administrative staff offices is related to the size of systems. Chapter VI presents the conclusions of the study, implications for practice, and recommendations for further study.

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CHAPTER II

REVIEW OF THE LITERATURE

Organizational Growth

Organizational growth and development is a subject of perennial concern in organization theory. For instance, Starbuck, in March's Handbook of Organizations, lists over two hundred references on the subject. (9, p. 527) Among these writings various points of view may be discerned. Some studies have examined motives for growth, dealing particularly with psychological and sociological influences on decisions which have led to the expansion of organizations. Others have taken up the determination of the relationship between size and age of organizations, the characteristic rates at which they grow, and the ways in which organizational structures alter with size. There is a small but significant body of work containing reflections upon the qualitative transformation which takes place in institutions as they grow. Many writers¹ believe that as organizations become larger, relationships between their parts begin to differ and new structures are required to support the changed form of the organization.

¹Tsouderos, Haire, Chapin, Simon, and Bonini, White.

Theorists have developed various aspects of what has been called the complexity assumption, and have pointed to the probable need for proportionately heavier structure, that is, administrative staffs, as organizations grow.

(9, p. 496) Perhaps the best known statement of this presumed result of growth, is the partly humorous, partly serious, Parkinson's Law, which says that as organizations grow, the ratio of staff employed in supervision will grow.

Blau and Scott point out that this is a common belief, it being widely assumed that large organizations tend to be over-bureaucratized, and that an increase in organizational size is accompanied by disproportionate increase in administrative overhead. (4, p. 18) They suggest that evidence does not support the assumption, and they quote the findings of several studies of industry in support of their belief.

Industrial Studies

Research by Baker and Davis into ratios of staff to line employees, and stages of differentiation of staff functions in 211 Ohio manufacturing firms, found no regularity in the relationship between size of organization and proportion of administrative officials. (2, p. 14)

By contrast, in a study of American manufacturing concerns, Melman found the relationship between size of organization and proportion of administrative officials to be an inverse one. (8, p. 64) Bendix obtained similar

findings for his study of German industry in the thirties. (3, p. 221)

In his examination of the history of the growth of four manufacturing companies, Haire established that the ratio of supervisors to supervised did not increase as the firms grew in size. (5, p. 298) He found that as the line of command increased, each supervisor was responsible for more men. His data also showed that management grows more slowly in size than the total number of employees and is an increasingly smaller part of the whole. (5, p. 297)

These and other industrial studies raise the question of the type of relationship that exists between the proportion of administrative staff and the total size of the organization in school systems.

Terrien and Mills Study

Terrien and Mills introduced their study by a consideration of the significance of changing size, particularly of increasing size, upon the form and structural relationships found in an organization. They then proceeded to a systematic empirical study of school systems for which they hypothesized, after Parkinson:

The relationship between the size of an administrative component and the total size of its containing organization is such that the larger the size of the containing organization, the greater will be the proportion given over to its administrative component. (10, p. 11)

The hypothesis was tested on a sample of school districts in California. Data were obtained from three kinds of school districts, namely, elementary, high school, and unified and city school districts. Districts were grouped according to size, and the administrative component was calculated for each. The accompanying table for unified and city school districts illustrates the findings of the study.

TABLE I
UNIFIED AND CITY SCHOOL DISTRICTS: FINDINGS
OF TERRIEN AND MILLS STUDY

Group Designation	Number in Group	Size Range	Administrative Component Mean Percentage	Standard Deviation
Small	13	13-249	13.7	3.7
Medium	27	250-999	14.3	2.5
Large	10	1000-4624	15.6	1.7

(10, p. 12)

Terrien and Mills found that in all three types of districts the administrative proportion of the organization rose from small through medium to large sized districts, showing a significant difference between small and large groups in each case. They say this of their findings:

indicate that the school administrator may expect that the percentage of his organization which is devoted to administrative tasks will rise as his organization grows. (10, p. 14)

The bases of the work by Terrien and Mills are replicated in part by the present study in order that valid comparisons might be made between them. Table XIII, for instance, shows the results of the present study in a form similar to that of Table I, page 18.

Anderson and Warkov found that these conclusions conflict with their own in their study of hospital organization. In the latter study, the findings were that, as hospitals increased in size, the percentage of personnel in administration decreased. In order to reconcile the findings of the two, they suggest that, as size increases, the administrative component decreases, but that "the administrative component increases with size when the number of places¹ at which work is performed increases," or when there is increasing specialization and differentiation of roles. (1, p. 27)

Indik's Study

Indik investigated organization size and supervision ratio in five different types of organizational units, namely package delivery stations, automobile sales dealerships, volunteer fire companies, labour union locals, and non-partisan

¹That is, number of different institutions in one system or organization.

political groups. His sample was composed entirely of what he termed three-level-organizations, that is, they contained two levels of supervision¹ above those who were concerned immediately with production, or who could be termed rank and file.

He considered two alternative hypotheses about organizational size and ratio of supervision. The first was that as the size of the organizational unit increases the ratio of supervision will tend to increase. This expectation can be derived from Parkinson's Law and from the mathematical specifications of Kephart, (7, p. 590) which show that there is some pressure and necessity to increase supervision at a faster rate than that by which the organization increases.

The alternative hypothesis was that as the size of the organizational unit increases the ratio of supervision will tend to decrease.

Indik speculated further that the relationship of size to supervision ratio would be curvilinear and logarithmic.

The findings of the study were that as the size of the organizational unit increased, the supervision ratio declined in all cases, and also that in each case the relationship could be expressed by a line which was logarithmic, curvilinear and asymptotic to the axis. There was found to be

¹No extended consideration will be given the matter of the numbers of levels of supervision in school systems.

a striking similarity among the slope of the curves for each of the sets of data.

TABLE II
ORGANIZATION SIZE AND SUPERVISION RATIO IN
FIVE ORGANIZATIONAL UNITS FITTING A
LINEAR LOGARITHMIC CURVE

Set of Organizations	N	$x = e$	a - by
Package delivery stations	32	$x = e$	4.08 - 7.484
Auto sales dealers	36	$x = e$	4.79 - 5.454
Volunteer fire companies	12	$x = e$	4.35 - 3.834
Industrial labour union locals	8	$x = e$	6.91 - 21.604
Non partisan political organizations	28	$x = e$	6.84 - 6.257

x the natural logarithm of organization size.
y supervision ratio. (6, p. 307)

In his discussion, Indik notes the discrepancy between his, and Terrien and Mills' data, and suggests that it may be due to the inclusion of staff non-supervisory personnel in the numbers of administrative staff in the earlier study.

Indik points out that his findings may only apply to local three-level organizations and may not be significant

for organizational units in which the complexity of task of lower level individuals increases with organizational size. In this case he suggests the supervision ratio may be expected to increase. His finding is consistent with Anderson and Warkov's proposition that if functional complexity stays the same, size and supervision ratio are negatively correlated.

Summary

The findings of the above studies lead to the general conclusion that the proportion of administrative staff in an organization decreases as the organization increases in size. However, the only reported study of school systems has produced findings which disagree with this generalization. The present study is directed towards the clarification of the relationship as it exists in the urban school systems of Western Canada.

Hypotheses

Hypothesis one. The proportion of administrative staff in a school system decreases as the size of the system increases.

Hypothesis two. When school systems are ranked in order of size, and their administrative staff listed, each administrative staff office begins to occur consistently at a specific size of school system.

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CHAPTER III

DESCRIPTION OF THE SAMPLE AND RESEARCH PROCEDURES

The Sample

It was important for the study that the school systems on which it was based should be free as possible from restrictions on the appointment of administrative staff. For this reason, information was sought from systems which were relatively discrete in their powers in this regard, and not subject to a close external control in the matter of appointment of staff. The desired characteristic was that systems were very largely responsible for their own administration, both in matters of the provision of the physical facilities for instruction, and for instruction itself, and that external authorities should not provide staff to bear the responsibility for any substantial area of administration within the system.

Characteristics such as these were found in the system in Alberta which had locally appointed superintendents. This set of systems also had the advantage for the study that they showed a gradation of size from very small to very large. Information was sought from all twenty Alberta systems with locally appointed superintendents, except from the two systems which are attached to military commands. One system

failed to supply the necessary information, so that there are seventeen systems from Alberta represented in the study. However, this number of systems appeared to be too small to provide an adequate basis for the study. It was therefore decided to obtain information from systems in other provinces.

Since the Manitoba urban single unit divisions appeared to be most similar to the Alberta city school units, they were approached next. They included divisions which had controlled both elementary and secondary education in their areas for some time. Also included were those divisions which had only recently combined the administration of the two types of schools as a result of a plebiscite held in March, 1967. Ten systems were approached in this province and returns were received from seven.

Saskatchewan systems were chosen on the basis that their operational area contained a city, and that the same chief executive officer was in control of both elementary and secondary education. Ten systems were approached, and responses were received from six.

In British Columbia the twelve largest systems of the province were approached. These were all known to be strongly urban in character and to have a diversity of administrative staff. Nine returns were received from the systems of this province.

Fifty-one systems in the four western provinces of

Canada were therefore approached for the purposes of the study. Thirty-eight responses were obtained. Seventeen responses came from the Alberta systems approached, six from the eleven Saskatchewan systems, seven from ten Manitoba systems and nine from twelve British Columbia systems. The sample thus constituted 75 per cent of the systems selected for study.

In summary, the systems of the sample varied in size, and in numbers of administrative staff. Most of the largest systems in each of the western provinces were represented, as well as systems with the minimum numbers of administrative staff. All the systems were urban in character, and each one administered both elementary and secondary education.

Assumptions

The study is dependent upon the accuracy of information supplied by each of the school systems. It is assumed that officials in school systems correctly understood the nature of the information required, and have made accurate returns of their administrative offices.

Limitations

The study is a cross sectional one. While it is anticipated that some kind of curvilinear relationship will be established, it should be emphasized that this may not

represent a growth curve, but rather a state of equilibrium achieved by a number of school systems in Western Canada at the present time. The states represented are thus current ones and reflect the present practices in educational administration.

Delimitations

The study is confined to certain contemporary characteristics of predominantly urban school systems in the four western provinces of Canada.

Collection of Data

Each of the school systems approached was asked to supply two sets of data. The documents used in requesting this information are shown in Appendix A. The first document was in the form of a letter introducing the writer, explaining the nature of the study and asking for information concerning administrative staff. The letter contained a general description of the positions which were to be considered as those of the administrative staff. By way of example, it suggested a large number of positions known to occur on the staffing lists of school systems. As was noted in the letter, a check-off list of positions was not provided because of differences of nomenclature between provinces and even between systems. It was expected that for each system, a list of administrative staff, or of staff

employed by the central office of the system would be supplied.

Analysis of Data

Administrative staff were identified according to the criteria presented in Chapter I. Central office administrative staff and principals were categorized separately in the initial stages.

The size of each school system was calculated according to the procedure outlined in Chapter I. Correlations between size of system and number of central office administrative staff, and between size of system and total administrative staff, were obtained and tested for significance. Regression analysis was applied to the data, and the best fit of a curve which would enable prediction of total administrative staff numbers from the size of the system was calculated. This analysis followed that used by Indik which assumed that the best approach to such a curve is by the derivation of an exponential function of the form $y = e^{ax}$ - by when x represents the size of the system and y represents the proportion of administrative staff.

Mean percentages and standard deviations for proportions of administrative staff of small, medium, and large school systems, were calculated using the same ranges as Terrien and Mills.

A frequency count was made of central office administrative staff offices. These offices, in the order of their frequency, were represented in a graphical form against the size of the school system in which they occurred.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The part of the study described in this chapter was concerned with establishing the statistical relationship between the size of the school systems and the proportions of administrative staff.

Data on the number of teachers, principals, and other certificated personnel in schools, as obtained from the returns from the school systems, were summarized. Administrative staff offices were identified from the lists of central office staff supplied. The total size of the system, that is, the total number of professional and administrative staff employed was calculated. The proportion which the total number of administrative staff formed of the size of the school system was calculated.

The correlation between the size of the school systems and the proportions of administrative staff was obtained. For the sake of a part of the discussion in Chapter VI, the correlation between the proportion of central office administrative staff and size of system was also calculated. The correlation between proportion of total administrative staff and size of system was also expressed as an equation to a regression line of the form $x = e^{a - by}$.

TABLE III

NUMBER OF PUPILS, TEACHERS, AND SCHOOLS
IN URBAN SCHOOL SYSTEMS IN SAMPLE:
ALBERTA

System	Number of Pupils	Number of Teachers including Principals on school staffs	Number of Elementary Schools	Number of Secondary Schools	Number of Combined Elementary Secondary Schools
AA	855	45	1	2	-
BA	1125	48	4	1	-
CA	1372	62	1	2	-
DA	1380	65	1	1	-
EA	1476	64	5	1	1
FA	1532	72	2	1	1
GA	1648	78	4	1	1
HA	1850	94	2	1	2
IA	2039	85	3	1	2
JA	2542	122	4	3	-
KA	4905	239	8	3	4
LA	5846	265	10	4	3
MA	7082	308	11	5	-
NA	16004	666	24	5	15
OA	21773	1073	27	11	30
PA	61000	3010	67	24	32
QA	63802	2938	90	29	22

TABLE IV
 NUMBER OF PUPILS, TEACHERS, AND SCHOOLS
 IN URBAN SCHOOL SYSTEMS IN SAMPLE:
 SASKATCHEWAN

System	Number of Pupils	Number of Teachers including Principals on school staffs	Number of Elementary Schools	Number of Secondary Schools	Number of Combined Elementary Secondary Schools
AS	1345	60	3	1	-
BS	1951	80	6	2	-
CS	3548	151	6	2	-
DS	4800	258	11	4	-
ES	7573	330	13	3	-
FS	9636	391	21	5	-

TABLE V
NUMBER OF PUPILS, TEACHERS, AND SCHOOLS
IN URBAN SCHOOL SYSTEMS IN SAMPLE:
MANITOBA

System	Number of Pupils	Number of Teachers including Principals on school staffs	Number of Elementary Schools	Number of Secondary Schools	Number of Combined Elementary Secondary Schools
AM	2197	108	2	1	5
BM	2798	131	6	2	1
CM	5710	254	7	4	2
DM	6593	323	5	2	6
EM	6966	294	7	4	-
FM	9989	343	5	4	8
GM	47939	2065	55	16	7

TABLE VI

NUMBER OF PUPILS, TEACHERS, AND SCHOOLS
IN URBAN SCHOOL SYSTEMS OF SAMPLE:
BRITISH COLUMBIA

System	Number of Pupils	Number of Teachers including Principals on school staffs	Number of Elementary Schools	Number of Secondary Schools	Number of Combined Elementary Secondary Schools
AB	5970	223	19	4	-
BB	6834	238	18	3	-
CB	10500	430	31	4	-
DB	13717	498	34	6	-
EB	19031	743	30	9	-
FB	23340	719	55	12	-
GB	26001	1006	34	10	1
HB	27252	1130	35	12	-
IB	72507	2908	65	17	-

Characteristics of the School Systems by Provinces

In Tables III and IV, the school systems which responded were shown by provinces, and were listed in order of size by numbers of certificated personnel in schools. These numbers were made up of teachers, school guidance officers, school librarians, and principals, that is, all the people on school staffs who were directly concerned with pupils and indirectly, if not directly, concerned with the instructional programme. The numbers of elementary and secondary schools were listed for each system.

The tables show the range of sizes of the school systems which were used in the study. The greatest range in size was shown by the Alberta systems, which were the most numerous of those responding. The Alberta systems ranged from the smallest used in the study to those which were among the largest. Following the categories of size used by Terrien and Mills, ten of the seventeen systems were categorized as small, since they had less than 250 teachers. There were four systems with teacher numbers lying between 250 and one thousand, and which were therefore categorized as of medium size, and four large systems with teacher numbers of more than one thousand.

The Saskatchewan systems were represented only in the small and medium sized categories with three and four

TABLE VII
ALL SCHOOL SYSTEMS OF SAMPLE RANKED
BY NUMBER OF TEACHERS^{*}

System	Number of Teachers on school staffs [*]	System	Number of Teachers on school staffs
AA	45	DS	258
BA	48	LA	265
AS	60	EM	283
CA	62	MA	308
EA	64	DM	310
DA	65	ES	330
FA	72	FM	343
GA	78	CB	430
BS	80	DB	498
IA	85	NA	666
HA	94	FB	719
AM	100	EB	743
JA	122	GB	1006
BM	122	OA	1073
CS	151	HB	1130
AB	223	GM	1957
BB	238	IB	2908
KA	239	QA	2938
CM	241	PA	3010

^{*}includes all certificated personnel
on school staffs.

systems respectively in each category. Though a smaller group than that of Alberta, it showed a relatively even progression of size similar to that of the major part of the latter province.

The Manitoba systems showed a progression of size similar to that of Saskatchewan, though the appearance of the large Winnipeg systems made a difference in this case.

Unlike the systems of the other provinces, those of British Columbia lay almost entirely in the large and medium size categories. Five systems of the nine represented were medium sized, three were large and one was small.

A summary of the previous four tables is shown in Table VII. This table introduces the sample of systems as a whole, and demonstrates the range of sizes which it encompasses. The systems are ranked in order of size by the number of teachers on their schools staffs.

Table VIII is a breakdown of Table VII by size, groups, and provinces.

TABLE VIII
CLASSIFICATION OF SYSTEMS OF THE SAMPLE BY
NUMBER OF TEACHERS AND PROVINCES

Class	Alberta	British Columbia	Manitoba	Saskatchewan	Total
1-249 teachers	11	2	2	3	18
250-999 teachers	3	4	3	3	13
1000 teachers	3	3	1	0	7
<u>Total</u>	17	9	6	6	38

Selection of Administrative Staff

From the lists of staff supplied by the school systems the administrative offices of each system were identified. The number of these offices and the proportion which they formed of their school system were calculated for each system.

Three categories of staff were shown, variously, in the returns. They were the following:

1. Administrative staff, concerned with the instructional programme, (or the goal achievement) of the system, and with the maintenance of the system through management of physical and financial resources. Personnel in this category

TABLE IX

NUMBER OF ADMINISTRATIVE AND NON-ADMINISTRATIVE CENTRAL
OFFICE STAFF, AND CALCULATION OF SIZE OF SYSTEM

System	Number of Central Office Administrative Staff	Number of other Central Office Professional Staff (non-administrative)	Number of Teachers Central Office Personnel shown	Size of System = Total of number of teachers and Central Office Personnel shown
AA	2	-	45	47
BA	2	-	48	50
AS	2	-	60	62
CA	2	-	62	64
EA	4.5	-	64	68.5
DA	2	-	65	67
FA	3	-	72	75
GA	4	-	78	82
BS	3	-	80	83
IA	4	-	85	89
HA	6	-	94	100
AM	5	-	100	105
JA	5	1	122	128
BM	3	3	122	128
CS	6	-	151	157
AB	5	1	223	229
BB	9	-	238	247
KA	9	-	239	248
CM	11	-	241	252
DS	9	-	258	267
LA	9	2	265	275
EM	8	3	283	294
MA	11	2	308	321
DM	9	2	310	321
ES	12	-	330	342
FM	10	8	343	361
CB	15	1	430	446
DB	8	2	498	508
NA	24	8	666	698
FB	20	4	719	743
EB	15	3	743	761
GB	17	3	1006	1026
OA	33	1	1073	1107
HB	36	2	1130	1168
GM	49	-	1957	2006
IB	63	6	2908	2977
QA	74	8	2938	3020
PA	66	23	3010	3099

TABLE X

NUMBER OF CENTRAL OFFICE ADMINISTRATIVE STAFF
AS PROPORTION OF SIZE OF SYSTEM

System	Size of System	Central Office Administrative Staff:	
		<u>Number</u>	<u>Number as percentage of size of system</u>
AA	47	2	4.3
BA	50	2	4.0
AS	62	2	3.2
CA	64	2	3.2
DA	67	2	2.9
EA	68.5	4.5	6.6
FA	75	3	4.0
GA	82	4	3.7
BS	83	3	3.6
IA	89	4	4.5
HA	100	6	6.0
AM	105	5	4.9
JA	128	5	3.9
BM	128	3	2.4
CS	157	6	3.8
AB	229	5	2.2
BB	247	9	3.6
KA	248	9	3.6
CM	252	11	4.3
DS	267	9	3.4
LA	275	8	2.9
EM	294	8	2.7
MA	321	11	3.4
DM	321	9	2.8
ES	342	12	3.5
FM	361	10	2.7
CB	446	15	3.4
DB	508	8	1.6
NA	698	24	3.4
FB	743	20	2.7
EB	761	15	2.0
GB	1026	17	1.8
DA	1107	33	3.0
HB	1168	36	3.2
GM	2006	49	2.4
JB	2977	63	2.1
QA	3020	74	3.4
PA	3099	66	2.1

were identified by the criteria proposed in Chapter I for all administrative staff. All systems returned this information.

2. Specialist professional personnel whose primary task was to work with children, and who exercised no significant interpersonal supervision of any staff of the system, nor took part in key organizational decision making. All systems returned this information.

3. Clerical and other office staff, and staffs of sections such as stores, equipment, maintenance, transport, and drawing office. This information was given only by the larger systems. Personnel in this category were omitted from calculations for the purposes of this study.

A list of positions found under the first and second categories is shown in Table IX. The total of these positions and the total number of certificated personnel in schools, as shown in this table, were summed to obtain the total size of system. In Table X the ratio of the number of central office administrative staff to the size of school system, as defined, is shown in percentage form.

In Table XI, the number of principals is listed beside the central office administrative staff of their respective systems, and the two quantities summed to give

TABLE XI

CALCULATION OF NUMBER OF TOTAL ADMINISTRATIVE STAFF

System	Central Office Administrative Staff	<u>Numbers of</u> Principals	Total Adminis- trative Staff
AA	2	4	6
BA	2	5	7
AS	2	4	6
CA	2	3	5
DA	2	2	4
EA	4.5	7	11.5
FA	3	4	7
GA	4	6	10
BS	3	8	11
IA	4	6	10
HA	6	5	11
AM	5	8	13
JA	5	9	14
BM	3	7	10
CS	6	8	14
AB	5	23	28
BB	9	21	30
KA	9	15	24
CM	11	13	24
DS	9	15	24
LA	8	17	25
EM	8	11	19
MA	11	16	27
DM	9	13	22
ES	12	16	28
FM	10	17	27
CB	15	35	50
DB	8	40	48
NA	24	44	68
FB	20	67	87
EB	15	39	54
GB	17	45	62
DA	33	68	101
HB	36	47	83
GM	49	78	127
IB	63	82	145
QA	74	141	215
PA	66	123	189

TABLE XII

TOTAL ADMINISTRATIVE STAFF AS PROPORTION OF SIZE OF SYSTEM

System	Total Administrative Staff	Size of System	Total Administrative Staff as percentage of size and system
AA	6	47	12.7
BA	7	50	12.5
AS	6	62	9.7
CA	5	64	9.4
DA	4	67	6.0
EA	11.5	68.5	16.9
FA	7	75	9.3
GA	10	82	10.9
BS	11	83	13.6
IA	10	89	11.2
HA	11	100	11.0
AM	13	105	12.5
JA	14	128	10.9
BM	10	128	7.8
CS	14	157	8.9
AB	28	229	12.3
BB	30	247	12.1
KA	24	248	9.6
CM	24	252	5.7
DS	24	267	9.0
LA	25	275	9.1
EM	19	294	6.4
MA	27	321	8.4
DM	22	321	6.9
ES	28	342	8.2
FM	27	361	7.5
CB	50	446	11.2
DB	48	508	9.4
NA	68	698	9.7
FB	87	743	11.7
EB	54	761	7.1
GB	62	1026	6.1
OA	101	1107	9.1
HB	83	1168	7.3
GM	127	2006	6.3
IB	145	2977	4.8
QA	215	3020	7.1
PA	189	3099	6.1

total administrative staff for each system. The proportion of administrative staff for each system is shown in the last column of Table XI.

Analysis of Data

Correlation. The Pearson product moment correlation was used to determine whether any significant relationship existed between size of school system and the proportion of administrative staff. The independent variable was continuous and thus suited to a correlation test of this type. The data for analysis, namely the proportions of administrative staff and size of school system are shown in Table XII.

The correlation coefficient between the size of the school system and the proportion of administrative staff as defined by the criteria was -0.5173 . With the number of cases under consideration here, the correlation had to reach a figure of 0.409 to be significant at the $p .01$ level. The variables therefore can be taken to be significantly negatively correlated.

For the purposes of a comparison between the findings of the present study and a proposition of Anderson and Warkov, which is discussed in Chapter VI¹, a correlation was obtained between size of system and proportions of the

¹Infra p.

system formed by the central office administrative staff as shown on Table X. The coefficient for these two variables was -0.4170 which was significant at the $p .01$ level.

This suggests that the size of school system is more highly correlated with the proportion of total administrative staff than with the proportion of central office administrative staff only.

Curvilinear relationship. It was proposed that the relationship between variables was logarithmic, curvilinear, and asymptotic, of the form $x = e^{a - by}$.

Manipulation of this expression gives:

$$\log x = a - by$$

$$by = a - \log x$$

$$y = \frac{a}{b} - \frac{1}{b} (\log x)$$

$$\text{If } \frac{a}{b} = C_1$$

then

$$y = C_1 - C_2 \log x$$

$$- \frac{1}{b} = C_2$$

$$C_1 = \frac{a}{b}$$

$$C_2 = \frac{1}{b}$$

In this expression x represents the size of the school system and y represents the proportion of total administrative staff.

TABLE XIII
 MEAN PERCENTAGE ADMINISTRATIVE COMPONENTS
 IN GROUPS OF SCHOOL SYSTEMS OF
 DIFFERENT SIZES

Group Designation	Number in Group	Size Range	Administrative Component Mean Percentage	Standard Deviation
Small	18	47-248	10.7	2.3
Medium	12	252-761	8.6	1.2
Large	7	1026-3099	6.7	1.3

Computation showed the value of C_1 to be 16.508 and C_2 to be -1.281. Thus, $a = 12.9$ and $b = -.782$ and the relationship can be expressed as $x = e^{12.9 - .782y}$. F ratios for C_1 and C_2 were 19.27 and 17.76 respectively, and probabilities were .0001 and .00016 which makes the relationship statistically significantly different from zero at less than the $p .01$ level of significance. The correlation coefficients show that the proposed curve fits the data quite well.

Figure 1 shows that plotting the data on a semi-log grid yields a set of points which upon inspection appear to regress to a line of negative slope. The equation derived above confirms this view.

For purposes of later comparisons with Terrien and Mills' data, the school systems were categorized by size into small, medium, and large systems using the size ranges of 0-249 for small size systems, 250-999 for medium size systems, and 1000 and over for large size systems.

In Table XIII, the mean percentage of the administrative component, and the standard deviation, from the mean is shown for each of the sizes of groups.

The table shows that among the systems used in the study, the mean percentage of the administrative component decreases with the group size. That is, the

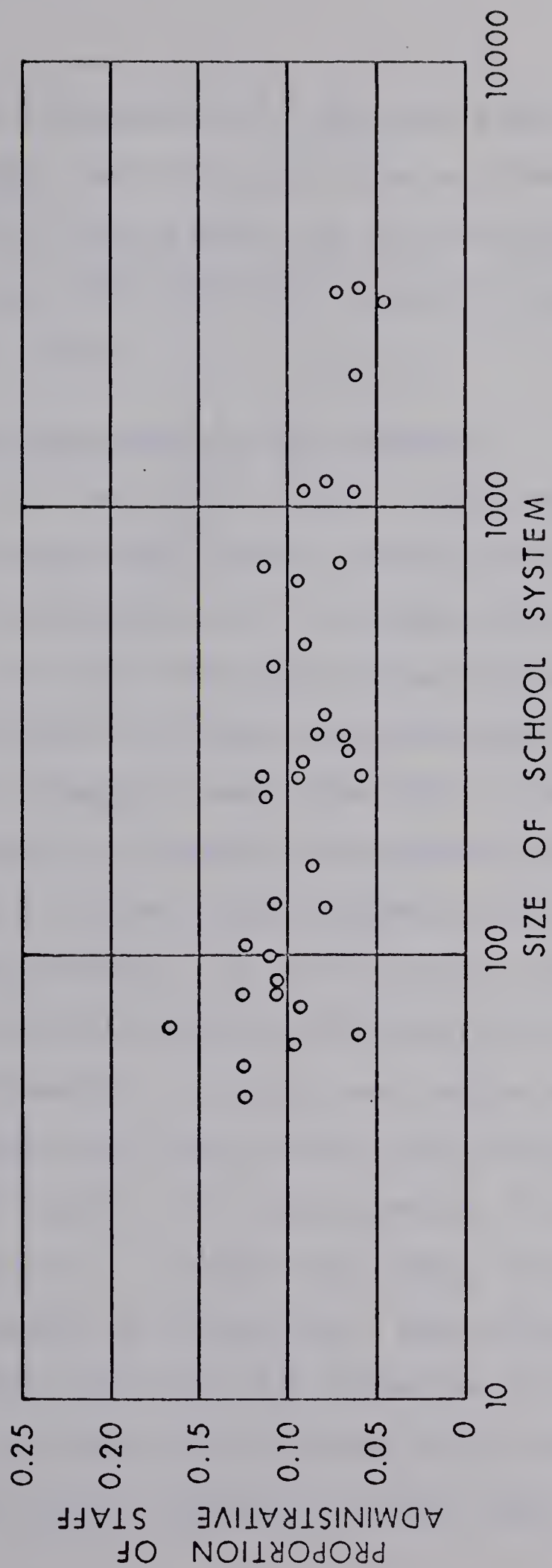


FIG. 1 PROPORTION OF ADMINISTRATIVE STAFF IN THE SCHOOL SYSTEMS OF THE SAMPLE

systems categorized as large have a smaller mean percentage administrative component than systems categorized as medium size, and that the largest mean percentage administrative component resides in the smaller systems.

Findings Presented in this Chapter

1. The size of school system was found to be significantly negatively correlated at the $p .01$ level with the proportion of total administrative staff.

2. The relationship between size of school system and proportion of total administrative staff is curvilinear, asymptotic, and logarithmic. That is, when this relationship was plotted in graphical form, it showed itself as a curved line, highest at the left side, that is where values of x , or the system sizes, were small. It approached closer to the x -axis as x -values increased. The decrease in y values was smaller as the systems grew larger, so that the line was curved in a concave upwards fashion. The line appeared to approach the y -axis as values of x became very large, so that x and y axes appeared as asymptotes. When plotted on a semi-logarithmic grid the line proved to be straight. (Fig. 3)

3. When school systems were considered in groups of sizes, small systems had larger mean percentage

administrative components than large systems.

Conclusion

Hypothesis One stated that the proportion of administrative staff in a school system decreases as the size of the system increases.

The analysis of the data in this study showed that for thirty-eight systems in the four provinces of Western Canada, larger systems tended to have proportionately smaller administrative staffs than smaller systems. This decrease in the proportion of staff devoted to administration is continuous between broad sections of the sample. The amount of decrease in the proportion of administrative staff with size of system is not constant, but itself decreases as systems increase in size.

Hypothesis One is therefore accepted.

CHAPTER V

THE RELATIONSHIP BETWEEN THE OCCURRENCE OF ADMINISTRATIVE STAFF OFFICES AND THE SIZE OF SCHOOL SYSTEMS

The purpose of the data analysis carried out in this chapter was to establish whether, when the school systems of the sample were arranged in order of size, the consistent occurrence of each of the administrative offices identified in the study was related to a specific system size. The analysis carried out was a simple examination of the data, to find how the occurrence of the administrative staff offices was related to the size of the systems. Apart from a frequency count, no statistical procedures were applied to the data.

An inspection of the number and types of the administrative staff offices occurring in the various systems showed that there was a marked contrast between the few largest systems and the remainder in this regard. The largest systems included many administrative offices which did not appear in the others. A single tabulation of the offices of all the systems would thus have included many offices which were not relevant to the large number of smaller systems. This would have made analysis of these

systems more difficult. It was therefore decided to divide the systems into two groups by size, and to examine them separately.

The first group examined consisted of the systems up to 1026 in size. (See Table XII, page 43). This made a group of thirty-two systems. The second group consisted of the remaining systems which were larger than 1026. This group numbered six in all. Following the examination of the two groups, the findings from each were summarized and synthesized on behalf of the whole sample. The break between the two sets of systems was made at system 1026 because this point appeared upon inspection to mark a sharper change in administrative staff numbers between systems, than had occurred before it.

The convention of referring to systems by their size has been adopted in this chapter. That is, the Alberta system which was referred to as CA on Table I, and which has a size of 62, was referred to in this chapter as system 62. This convention enabled systems to be identified, and their sizes to be indicated, simultaneously. Since the size of systems was one of the crucial variables present in the work reported in this chapter, it needed to be referred to frequently. The use of the convention obviated the necessity for a separate statement of size for each system which was mentioned in the text, or

alternatively, the necessity for the reader to refer back to a table of the sizes of systems.

In order to compare the positions categorized as administrative staff in the systems of the sample it was first necessary to recognize the functions for which a varied nomenclature was used and to impose a single title for each. To do this, the central office administrative staff positions were listed in groups by similarity of function, and given a title by which they were subsequently recognized and counted.¹ This operation is shown in Table XIV.

IV. THE SMALLER SYSTEMS

The frequencies with which the administrative positions occurred in the systems of the first part of the sample were calculated. In Figure 2 the positions are set out on the left hand side in descending order of the frequencies thus determined. School systems, up to and including system 1026, are set out in ascending order of size along the upper horizontal edge of the figure, which thus shows the occurrence of the positions by size of system.

¹It is possible that mistakes may have been made in thus classifying offices. However, a spot check with several school systems did not reveal any errors that might invalidate the conclusions.

SIZE OF SCHOOL SYSTEM

NAME OF OFFICE	47	50	62	64	67	68	75	82	83	89	100	105	128	128	157	229	247	248	252	267	275	294	321	321	342	361	446	508	698	743	761	1026	FREQ.
SUPERINTENDENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	32
SECRETARY TREAS.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	32
SUPERVISOR 1							X																										21
SUPERVISOR 2																																	18
SUPERVISOR 3																																	14
DIRECTOR ELEM						X																											13
ACCOUNTANT 1												X																					12
DIRECTOR OF GUIDANCE																																	11
ASSIST. SUPT.									X																								11
LIBRARY OFFICER						X	X										X																10
CONSULTANT 1										X																							9
BLDG & MAINT. OFF.																	X																8
DIRECTOR SECY.																																	8
ASSIST. SECY. TREAS.						X	X																										7
SUPERVISOR 4															X																		6
SUPERVISOR 5																																	4
CONSULTANT 2										X																							4
ACCOUNTANT 2																		X															4
PURCHASING OFF.																																	4
SUPERVISOR 6																																	3
CONSULTANT 3																																	3
ASSIST. SUPT. 2																																	3
A/V SUPERVISOR																																	3
SUPERVISOR 7																																	3
DIRECTOR ADULT ED																																	3
TESTS & MEAST. OFF																																	2
BLDG & MAINT. OFF																																	2
ADMIN. ASSIST.																																	2
DIRECTOR RES. & PL.																																	2
SUPERVISOR 8																																	1
SUPERVISOR 9																																	1
SUPERVISOR 10																																	1
OTHER																																	1

FIGURE 2 THE OCCURRENCE OF ADMINISTRATIVE STAFF OFFICES IN THE SMALLER SYSTEMS OF THE SAMPLE

The Figure shows the variety of administrative staff offices present in the smaller systems of the sample. In particular, the size of the system at which specific offices appear, and the regularity of their subsequent occurrence, can be observed.

Initial Diversification of Staff Positions

To begin with, an examination was made of those offices which represented the first addition to the administrative staff after the offices of superintendent and secretary-treasurer had been established. The latter positions, of course, appeared in all systems. In making an examination of the systems which showed the first additional one or two offices, it was necessary to examine five systems, namely 69, 75, 82, 83, and 89. The following positions then came under consideration:

Library Officer	-	-	-	-	-	-	-	-	2
Assistant Secretary-Treasurer	-	-	-	-	-	-	-	-	2
Consultants	-	-	-	-	-	-	-	-	2
Assistant Superintendent	-	-	-	-	-	-	-	-	1
Director of Elementary Education	-	-	-	-	-	-	-	-	1
Subject Supervisor	-	-	-	-	-	-	-	-	1

The appearance of these first additional offices was not closely related to the order established by the frequency count, nor to a subsequent regularity of appearance.

The positions of library officer which appeared in systems 75 and 82, which were closely spaced early in the Figure, did not appear regularly thereafter until systems larger than 247. The subsequent occurrences of the position of assistant secretary-treasurer did not take place until system 252, and were limited to five, irregularly spaced over fourteen systems.

The position of director of elementary education occurring in system 68 was reported as a half time one. The data showed that this system had six elementary schools whereas the smaller systems all had no more than two, and the two immediately larger systems had three and four, respectively. This position did not reappear until system 128 and with some omissions appeared regularly thereafter.

The position of assistant superintendent appeared first in system 83, that is, two systems later than that in which the position of director of elementary education first appeared. The position had a relationship, similar to that of the director of elementary education, to the number of elementary schools in the system. It showed irregularity in subsequent appearance, occurring only nine times in the next twenty-four systems. A possible relationship between the positions of assistant superintendent and director of elementary education is discussed later in this chapter.

TABLE XIV

NOMENCLATURE FOR ADMINISTRATIVE STAFF OFFICES

Offices Reported by Systems	Category
Superintendent Director of Education District Superintendent	Superintendent
Deputy Superintendent Assistant Superintendent	Assistant Superintendent
Superintendent of Elementary Education Superintendent of Elementary Schools Superintendent of Elementary Instruction Director of Elementary Education Co-ordinator of Elementary Education	Director of Elementary Education
Superintendent of Secondary Schools/Education Co-ordinator of Secondary Education Director of Secondary Education	Director of Secondary Education
Supervisor of Guidance and Special Services Director of Counselling Supervisor of Counselling Services Supervisor of Guidance Co-ordinator of Counselling Services Supervisor of Special Education and Guidance Services Supervisor of Special Education and Counselling Director of Special Services	Director of Guidance
Administrative Assistant	Administrative Assistant
Director of Adult Education Co-ordinator of Adult Classes	Director of Adult Education
Research and Planning Officer Research Consultant	Research and Planning Officer

TABLE XIV (continued)

Offices Reported by Systems	Category
Psychometrist	Test and Measurement
Supervisor of Tests and Measurement	Supervisor
A/V Co-ordinator	
Instructional Materials Officer	Instructional
Supervisor of Instructional Materials	Materials Officer
Divisional Supervisor	
Specialist Supervisor	
Elementary Supervisor	
Supervisor of Music	Supervisor (1)
Supervisor of Physical Education	(2)
Supervisor of Instruction (Intermediate)	(3)
Supervisor of Instruction (Primary)	(4)
Supervisor of Special Education	(5)
Supervisor of Industrial Education	(6)
Supervisor of Industrial Arts	(7)
Supervisor of Home Economics	(8)
Supervisor of Occupational Programme	(9)
Supervisor of Occupational Classes	(10)
Primary Supervisor	(11)
Supervisor of Developmental and	(12)
Remedial Reading	(13)
Supervisor of Elementary Classes	(14)
Subject Consultant	Consultant (1)
Programme and Curriculum Assistant	(2)
	(3)
Secretary-Treasurer	
Business Manager	Secretary-Treasurer
Assistant Secretary-Treasurer	Assistant Secretary
	Treasurer
Accountant	Accountant (1)
Comptroller	Accountant (2)
Buildings and Grounds Superintendent	
Superintendent of Maintenance	
Assistant Superintendent of Maintenance	
Maintenance Supervisor	Buildings and Main-
Buildings and Maintenance Supervisor	tenance Supervisor
Buildings Superintendent	
Purchasing Agent	Purchasing Agent

Three positions remained for consideration in the group of first additional offices. They were those of supervisor (1) and Consultant (1) and consultant (2). Of the three positions, that of supervisor was least out of place. It was the most numerous of all the offices except those of superintendent and secretary-treasurer. It was also closer than any of the other positions discussed in this group to a regular occurrence in school systems. This began at system 100.

In summary two observations can be made:

1. Of the first six additional positions¹ which occurred in this sample of school systems, it can not be said of the occurrence of any of them, that it marked the immediate beginning of the consistent occurrence of that office in larger systems.

2. The offices which occurred in the initial pattern of diversification were not those which might have been expected from the frequency count of administrative offices in this portion of the sample.

The Occurrence of the Major Offices

Supervisors. The frequency count shows that the

¹That is, Library Officer, Assistant Secretary-Treasurer, Consultant, Assistant Superintendent, Director of Elementary Education, Supervisor.

most numerous administrative office after that of superintendent and secretary-treasurer was that of supervisor of an area of instruction. Regular appointment of supervisors began with system 100, in which there were three appointments to this office. Consistency of occurrence of the office was shown by the fact that in the subsequent twenty-two systems, fifteen had at least three supervisors, eighteen systems had two and twenty-one had one.

Two systems reported having no supervisors, namely systems 128 and 275. System 446 reported having only one. System 128 had a notably smaller administrative staff than the four preceding systems, and in fact had an administrative staff similar in size to that of system 83. System 275, while having no supervisors, had three consultants in instructional areas.

Table XV shows the numbers of supervisors for each system above and including system 100. There was apparently no significant correlation between size of system and number of supervisors between systems 100 and 508. More than three supervisors appeared consistently only in systems larger than the latter.

With system 698, a sudden expansion of the number of supervisors in the sequence of systems occurred. This

system had seven supervisors, a pattern which was repeated twice more in the next three systems. System 698, then, appeared to mark a threshold in size in the provision of a greatly increased number of offices of supervisors.

Directors of Elementary Education, Assistant Superintendent

In each of the systems 128, there were two offices which could be recognized as those of high level generalists, and which could be taken to represent the first major change in hierarchical structure. These were the offices of assistant superintendent, and director of elementary education.

A detailed examination of Figure 2 showed that these offices appeared to be mutually exclusive in systems between 128 and 698 inclusive, with the exception of system 342. That is, systems which had a director of elementary education did not have an assistant superintendent, and vice versa.

The relationship between the two offices was suggested by returns from several systems, which indicated that the duties of the first assistant superintendent appointed lay with the elementary schools of the system. For example, system 128 reported "1 assistant superintendent in charge of the elementary programme." System 294 reported "1 assistant superintendent - elementary."

The early and consistent concern of administration

with elementary education was shown by the fact that the two systems between 128 and 694, which had neither of these offices, did have supervisors who were specifically concerned with the whole of the elementary programme. That

TABLE XV

NUMBER OF SUPERVISORS IN SYSTEMS 100-1026

School System	Number of Supervisors	School System	Number of Supervisors
100	3	294	3
125	3	321	5
128	2	321	3
128	2	342	3
157	3	361	3
229	1	446	1
247	2	508	2
248	3	698	7*
252	3	743	7
267	2	761	4
275	0	1026	7

*System 698 is suggested as threshold for the consistent appearance of a larger number of supervisors.

is, system 157 has an 'elementary supervisor' and system 361 has a 'supervisor of elementary classes' who is assisted by two consultants.

TABLE XVI

COMPARISON OF OCCURRENCES: OFFICES OF ASSISTANT
SUPERINTENDENT AND DIRECTOR OF
ELEMENTARY EDUCATION

System	Assistant Superintendent	Director Elemen- tary Education
128	X	-
128	-	X
157	-	- has elementary supervisor
229	-	X
207	-	X
248	X	-
252	X	-
267	-	X
275	X	-
294	X	-
321	X	-
321	-	-
342	X	X
361	-	- has supervisor of elementary classes
446	-	X
508	-	X
698	X	X
743	X	X
761	X	X
1026	X	X

Two elements were present in this discussion. One was the recognition of the first division of hierarchical structure below the office of superintendent, and the other was the recognition of the first establishment of an office concerned with control of a specific part of the instructional programme. These two elements appeared to be combined in one office. This office was concerned with the direction of elementary education. It occurred first, with system 128 and reappeared consistently thereafter. Beginning with system 698, the offices of director of elementary education, and of assistant superintendent occurred separately. The separation appeared to suggest that at this level, the duties of each of the offices were different and that the office of assistant superintendent was not specifically concerned with the direction of either elementary or secondary instruction.

Control of Secondary Education

An office specifically in charge of secondary education did not appear until systems were much larger than those in which the office directing elementary education first occurred.

The first office specifically in charge of secondary education occurred with system 275. Even though system 294, which is next in size, has an 'assistant superintendent-

secondary', this did not represent a beginning to the consistent appearance of the office. Of the next five systems, for instance, only one had an office of this category and consistent appearance of it began only with system 446.

The earlier discussion of the relationship between the function of director of elementary education and the first assistant superintendent, prompted a consideration of the relationship between the second assistant superintendent and the control of secondary education.

Three second assistant superintendents appeared in the figure, all in the five systems between 252 and 321. In only one of these three cases could it be definitely established that the principal task of the second assistant lay in the area of secondary education, that is, system 294 which reports 'assistant superintendent-secondary'.

From these considerations it could be said that an office exercising specific direction over secondary education in systems in this sample, appeared in systems greater than 250 in size, though not until system 446 did it appear in every system.

Director of Guidance

This position was identified in ten of the latter fifteen systems of the sample beginning with system 248.

The office appeared under different titles, the most common being supervisor of guidance. For the purposes of the study, however, the office was categorized as Director of Guidance, since the title of supervisor was retained for the category of those who were concerned with areas of instruction either by grade or by subject. Another reason for the use of the term director was that it indicated the hierarchical status frequently held by the office.

In six of the ten cases referred to above, the office was concerned with the supervision of at least two other persons who were attached to the central office. These persons were employed variously in the fields of guidance, counselling or social work. The four remaining systems gave insufficient evidence about the employment of personnel in these fields to enable the status of the office to be perceived.

In a number of cases it appeared that the term director with its implication of hierarchical status was justified, though a strong case on this point would require additional information about the extent of employment of guidance personnel in schools. In this regard, it is worth noting that the four systems immediately smaller than 247 had no guidance or counselling personnel employed in the central office, though they did have one or two such

persons employed in their schools. Five systems larger than 247 did not have an administrative staff position concerned with guidance. However, two of these systems employed one worker in this field, and three systems employed two. These systems were not notably different in numbers of secondary schools from the smaller systems, which did employ an administrative officer of guidance. In this sample of schools, an office of administrator of school guidance for the school system occurred first in system 247, and recurred consistently thereafter, though not in entirely consecutive fashion.

Business Operations

The office of assistant secretary-treasurer appeared to be the first added to that of the secretary-treasurer on the business management side of the operation of the school systems of the sample.

The occurrence of the office was discussed in the early part of this chapter, where it was pointed out that though assistant secretary-treasurers were listed on the administrative staffs of some quite small systems, and so appeared quite early among the ranked systems of the sample, the office did not recur until much later, and its recurrence in larger systems was irregular and inconsistent.

The office of accountant (1) occurred later than

that of assistant secretary-treasurer among the ranked systems of the sample, but it had a greater frequency of occurrence; it occurred first in system 125 but did not reappear until system 229, when it began to appear consistently, except for a gap of four systems from 267 to 321. In system 267, the function could perhaps be supplied by the office of assistant secretary-treasurer, but in the remaining three systems, no additional administrative staff for business operations were reported.

The position of second accountant had a frequency of four, and its occurrence was spread over a wide range of systems between 248 and 761 with wide, though decreasing, gaps between them. In two cases, the position occurred in systems which had larger proportions of administrative staff than their immediate neighbours.

Diversification of control of business operations, then, appeared to be established at system 229 with the office of accountant. The establishment of a third business management office did not occur in consecutive systems until system 698, when three out of four successive systems appointed either a second accountant, or an assistant secretary-treasurer, in addition to a secretary-treasurer and accountant. The increase in administrative staff in this respect is taken up at this point in the discussion of larger systems.

Buildings and Maintenance Office

This office first occurred in system 247. There were seven further appearances in the following fifteen systems. The appearances were irregularly spaced, with a particular concentration of five of them in the six systems between 321 and 508 inclusively. A second office occurred in only two widely separated systems, namely 252 and 361, so that no generalization could be made about it.

Of the first office, it could be said that its regular occurrence did not begin until system 321, despite its appearance in systems 229 and 267. The occurrence of the office was somewhat inconsistent, though it was evidently related to the size of the system. Inspection of the data showed that the non-occurrence of the office did not appear to be related to either an unusually small number of schools in the system or an unusually small number of administrative staff.

Other Offices

The offices which appeared more than once in this portion of the sample of school systems, and which have not so far been discussed are listed below, with their frequencies:

Purchasing agent	-	-	-	-	-	-	4
A/V supervisor	-	-	-	-	-	-	3
Administrative assistant		-	-				2
Tests and measurements officer	-	-					2
Director of adult education	-	-					2

Allof these offices occurred in the upper third, by size, of this portion of the sample. The latter two offices, namely that of tests and measurement officer and director of adult education both occurred in the same two of the three largest systems, appearing first in system 761.

The offices of purchasing agent and A/V supervisor occurred first in system 321, and were not consistent in their appearance thereafter. Three occurrences of the office of purchasing agent were with systems which had a larger administrative staff than their neighbours. This could also be said of two of the three occurrences of the office of A/V supervisor.

The office of administrative assistant appeared in two widely separated systems, system 275 and system 698, and in both cases it appeared to be attached to a senior office. In system 275 it appeared as a position which was complementary to that of the superintendent, and in system 698 it was related to a position of Director of Education which had been categorized as assistant superintendent for the purposes of this study. System 275 had a defined structure of superintendent and directors, actually 'co-ordinators' of elementary and secondary education. The appointment of an administrative assistant would appear to be a device to increase the operational

capacity of the senior levels of the systems, without further diversifying the structure by the creation of an additional hierarchical position.

The same argument may apply to the position in system 698 where the structure was made up of superintendent, director of education, (plus administrative assistant) and directors of branches (3).

V. THE LARGER SYSTEMS

In this section of the sample there were six school systems. In order of size these were:

system	1106
system	1168
system	2006
system	2977
system	3020
system	3099

The administrative offices which occurred in each of these systems are discussed below under the headings which refer to major functional areas of school systems.

Senior Administrative Level

As in the smaller systems the office of superintendent as that of the chief executive, appears in each of the systems. Below this office, divisions of responsibilities occurred in a more marked fashion than with the smaller systems so that a distinct departmentalization was observable.

There was, however, some variation in the patterns of structure development shown in the systems. In four of the six systems, the divisions occurred immediately below the office of superintendent, but in two cases there was an additional hierarchical level created by the establishment of an office between that of superintendent, and those in charge of the various divisions.

This was observable in the largest system, system 3090, which had established the office of associate superintendent. This system in fact had two associate superintendents, one in charge of instruction, and the other in charge of business, below whom were assistant superintendents in charge of separate departments. The differentiation of this office also occurred in system 1168 which had an office of assistant superintendent superior to the offices which directed departments, such as those of elementary and secondary education.

The office of assistant superintendent appeared in three of the four remaining systems, in each case it was that of the director of a department of either elementary or secondary education. System 3020 which was the second largest system of the set had no office of assistant superintendent, nor any office between that of superintendent and those in charge of the divisions mentioned here. It was evident that appointment of

assistant superintendents in addition to directors of secondary and elementary education, a feature which was observed first in system 698 and which occurred in the last four of the smaller systems, did not occur consistently in the larger systems.

Departments of Elementary and Secondary Education

In the discussion of the smaller systems of the sample the occurrence of separate direction of elementary and secondary education was noted. In the larger systems the most notable feature of each of these departments was the establishment of additional offices concerned with their administration. System 1168 was an exception among the larger systems in this regard, since it repeated the pattern observable in the latter part of the set of smaller systems.

System 1107 had additional line structure at the head of each department in the offices of director and assistant director. This feature was also present in system 2006 where there was a deputy assistant superintendent in addition to each of the assistant superintendents in charge. Also present in each of these departments was the office of administrative assistant. A further diversification of the pattern of administrative staff offices concerned with instruction in this system was

the occurrence of the office of deputy assistant superintendent for vocational education.

In system 2006 then, there were three administrative offices concerned with elementary education, compared with two in system 1107, and there were four offices concerned with secondary education, including one to deal with vocational education.

The remaining systems, namely 2797, 3020, and 3099, were quite similar in size, and they showed a similarity in staffing, particularly in line offices. The administrative structure of the two departments in these three systems can be shown as follows:

<u>Elementary Education</u>	<u>Secondary Education</u>
System 2977	System 2977
Assistant Superintendent Elementary Schools	Assistant Superintendent Secondary Schools
Director of Instruction: Elementary	Director of Instruction: Secondary
Director of Instruction: Elementary	Inspector of Schools
Inspector of Schools (65 elementary schools)	Inspector of Schools (17 secondary schools)
System 3020	System 3020
Superintendent of Elementary Schools	Superintendent of Secondary Schools
Assistant Superintendent of Elementary Schools	Assistant Superintendent of Secondary Schools

Elementary Education

System 3020

Assistant Superintendent of
Elementary Schools

(90 elementary schools)

System 3099

Assistant Superintendent of
Elementary Education

Director, Division I
Director, Division II
Director, Elementary Curriculum

(97 elementary schools)

Secondary Education

System 3020

Assistant Superintendent of
Secondary Schools

(29 high schools and junior
high schools, plus elementary-junior high schools)

System 3099

Assistant Superintendent,
Department of Secondary
Education

Director of Senior High
Schools
Director, Secondary Curriculum
Director, Junior High School
Administration
Director, Junior High School
Instruction

(49 secondary schools)

In summary it can be said that diversification of structure in departments of elementary and secondary education appeared in system 1107, though this was not confirmed by the staff pattern of system 1168. With system 2006, however, five line offices and two staff offices occurred. In the larger systems, all approximately 300, three or four line offices were found in each of the two departments.

Variations of nomenclature of the offices in these departments were noticeable, particularly in the three largest systems, and the precise titling of the offices in

system 3099 contrasted with the general names used in the other systems.

Supervisors and Consultants

In the examination of the set of smaller systems, the pattern of systems having seven or more supervisors was observed to occur in three of the last four of them. This fact is referred to here since the first two of the larger systems appears to share in the same pattern.

Another observation made upon the characteristics of the set of smaller systems was that the office of consultant occurred inconsistently and in a fashion only partially related to the size of the system. This tendency was also observable in the occurrences of the office of consultant in the larger systems.

Table XVII, page 77, shows that the general relationship of numbers of supervisors to the size of school system, which was observed in the set of smaller systems, is also present in the set of larger systems. In addition, there are virtually no areas of supervision found in larger systems which were not already discernible in the smaller ones of the sample. Thus there is a link between the larger systems of the smaller set and the systems of the larger set.

Table XVII shows the details of the marked expansion of the number of supervisors which occurred with system 2006.

TABLE XVII

DUTIES OF SUPERVISORS IN LARGE SYSTEMS

System 1107	System 1168	System 2006	System 2977	System 3099
Elementary	Primary Primary	Primary Elementary	Primary	Division I Division I Division II Division II
Secondary	Home Economics	Home Economics Languages Science	Intermediate Grades Home Economics	Division III Division III Modern Languages
Industrial Arts and Vocational Education	Industrial Education	Industrial Arts Fine Arts Fine Arts	Industrial Education Commercial Classes Occupational Classes	Girls' Technical and Industrial Education Business Educa- tion Vocational Education
Physical Education	Physical Education	Director of Physical Education Assistant Director of Phys. Ed.	Physical Education	Physical Educa- tion Physical Educa- tion Physical Educa- tion
Music Music	Music	Music Director Assistant Music Director	Music	Music Music Music
			Art	Drama Art Art
		Special Education Special Education	Special classes	

TABLE XVIII

DUTIES OF CONSULTANTS IN LARGE SYSTEMS

System 1107	System 1168	System 2006	System 2977	System 3099
Primary Reading Special Education			Primary Primary	Division I Division II Division II Division II
Secondary Maths			Intermediate Intermediate	
			Industrial Education	
			Music	
Physical Education				Physical Ed. Physical Ed.
Art				Art
Religious Education				

TABLE XIX

NUMBERS OF SUPERVISORS AND CONSULTANTS IN LARGE SYSTEMS

System	Supervisor	Consultant
1107	7	6
1168	7	0
2006	19	0
2977	11	6
3020	19	15
3099	19	7

In this system, the areas served by one supervisor in the previous two systems were served by at least two and usually more, creating a pattern similar to that of system 3099 which had a similar number of supervisors. By comparison, system 2977 appeared to have an unusually small number of supervisory offices, but it should be noted that the areas served by those which had it, were similar to those of its neighbouring systems, and that it employed an unusually large number of consultants.

Guidance, Pupil Personnel Services, Special Education

In place of the single office concerned with the direction of guidance work in the schools, larger systems tended to have a department or set of offices which provided a number of services in the above mentioned fields. The related offices in the larger systems, as they appeared in the various systems are shown below.

System 1107	Acting Supervisor of Guidance
System 1168	Co-ordinator-Counselling Services
	Special Counsellor and Guidance Supervisor
	Supervisor of Special Education
System 2006	Guidance Supervisor
	Director of Special Education
	Assistant Director of Special Education (2)

System 2977 Supervisor of Counselling Services

Supervisor of Special Classes

These two offices were included in a department of research and special services, which was under the control of its own director.

It included psychologists, psychometrician, an assistant in research and testing, and an officer for home instruction and testing.

System 3020 Superintendent of Special Educational Services

Supervisors (2)

Consultants (2)

These offices were at the head of a division which had reading clinicians, visiting teachers, special pathologists, psychologists, psychometrists and attendance offices, totalling 27 personnel employed from the central office .

System 3099 Assistant Superintendent, Department of Pupil

Personnel Services

Director of Bureau of Child Study

Director of Special Education

System 3099 Director of Counselling

Careers and Placement Officer

Special Education Consultant

This department controlled visiting teachers,

remedial teachers, a speech therapist, and a reading specialist, totalling 24 personnel in all .

In the smaller systems, the beginnings of the organization of a department of pupil personnel services could be discerned, perhaps as early as system 361. However, the evidence available reflected a lack of uniformity in the manner of occurrence of the offices concerned with these services, and in the establishment of structures for this aspect of administration, in successively larger systems.

It was not until system 2006 that control of any part of this work moved to an officer who was named as other than a supervisor or a co-ordinator, and only in the largest systems, namely 3020 and 3098 were the services combined in a single department in charge of a single officer.

Additional Offices

Director of Adult Education. This office appeared first in two or three largest systems of the set of smaller systems. It reappeared consistently in four out of the six larger systems so that system 743 could be said to mark the first regular occurrence of the office.

Tests and Measurement Officer. This office occurred

first in system 743 also, though it recurred in only three of the larger systems, namely 1160, 2977, and 3020. System 743 was a possible threshold for this office also.

Offices Occurring Uniquely in the Larger Systems

Listed below are the offices which did not occur in systems smaller than 1107.

System 1107	Supplies and Text-book Rental Officer Assessment Officer
System 2006	Data Processing Officer Personnel Officer
System 2977	Director of Counsellor Training Programme Supervisor of Publications Publications Editor Supervisor of Cafeterias
System 3020	School Job Training Counsellor Director, Elementary School Programme Commission Director of Auxiliary Services
System 3099	Director of Personnel-Instructional Director of personnel-Business

The two offices named in system 3099 immediately above, were shown as being attached to the office of superintendent in this system. Together with an administrative assistant in each case they formed a unique arrangement of administrative

offices at this level.

Business Management

In the smaller systems, previously discussed, it was noted that a third business official occurred consistently only in the largest of them. Three of the last four systems of that set had either two accountants, or an accountant and an assistant secretary-treasurer. Previous to system 698 it was usual to find only one other office, either that of second accountant, or of assistant secretary-treasurer, in addition to the office of secretary-treasurer.

The first of the larger systems, system 1107, like the last of the smaller systems, system 1062, had only two of these offices, and these two systems constituted an apparent interruption in the sequence of this section of administrative structure.

With system 1168, however, each system had the offices of both assistant secretary-treasurer and second accountant. In fact, with this system, the office of assistant secretary-treasurer was established as separate from that of the office of accountant, since at least two offices of accountant appeared at this point, and recurred in each of the subsequent systems.

Business Offices, in Addition to Secretary-Treasurer

System 1168 Assistant Secretary-Treasurer

System 1168	Accountant
	Payroll Account
System 2006	Assistant Secretary-Treasurer
	Chief Accountant
	Assistant Accountant
System 2797	Assistant Secretary-Treasurer
	Chief Accountant
	Assistant Accountant
	Payroll and Records Supervisor
System 3020	Assistant Secretary-Treasurer
	Chief Accountant
	Assistant Accountant
	Payroll Accountant
System 3099	Deputy Secretary
	Deputy Treasurer
	General Accountant
	Payroll Supervisor and Accountant

In the systems used for this study, the offices of assistant secretary-treasurer, as a third business management office, first began to occur consistently with system 743, though it was not until system 1168 that the office appeared in each consecutive system.

The occurrence of a second accountant's office, in addition to the office of assistant secretary-treasurer,

also took place first in system 1168. This office was not found in association with the office of assistant-secretary in any of the smaller systems in which it occurred. Additional accountancy offices were observable in the larger systems. Each of the systems 2977, 3020, 3099 had three such offices.

In summary it can be said that two business offices appeared consistently with system 229, and three offices appeared with system 698. With system 1168, four offices were established, the offices being those of secretary-treasurer, assistant secretary-treasurer and a first and second accountant. Additional accountancy offices occurred in systems of approximately 3000.

Other Business Management Offices

Purchasing agents were appointed by five of the six larger systems. There were four irregular occurrences of this office in the last nine systems of the smaller set, and, though there were two consecutive occurrences of it in systems 698 and 743, it did not appear consistently until system 1107. Systems 2006, 2977, and 3099 showed second offices with this function, in each case associated with a buying staff.

Building and Maintenance Staff

The regular occurrence of a building and maintenance

office in the smaller systems was noted and discussed earlier. The appearance of the second of these offices and its few and inconsistent occurrences was also discussed.

With the larger systems there was a consistent and regular appearance of large administrative staffs associated with these operations, as is shown by the list below.

System 1107	Properties Superintendent Maintenance Supervisor
System 1168	Superintendent, Building and Grounds Assistant Superintendent, Building and Grounds (Technical) Assistant Superintendent, Building and Grounds (Projects) School Planner
System 2006	Architect Assistant Architect Building Inspector Director, Building and Maintenance Assistant Director, Building and Maintenance Deputy Assistant Director, Building and Maintenance
System 2797	Director, Construction and Maintenance Chief Architect Assistant Architect Chief Clerk of Works

System 2797	Maintenance Superintendent
	Operations Superintendent
System 3020	Architect
	Building Engineer
	Buildings Superintendent
	Maintenance Supervisor
System 3099	Assistant Superintendent, Department of School Facilities
	Director of Planning
	Director of Design Research
	Director of Construction
	Director of Maintenance

The occurrence of two offices appeared to be definitely established with system 1107. More than two offices, however, occurred in each of the other large systems. System 1168 with four offices was characteristic of the remaining systems. The differentiation of functions shown by building and maintenance staff was most plainly seen in the three largest systems, since the titles used serve to point to gross distinctions between functions within this department. In system 2006, this observation was partly true, but in system 1168, the generalized titles enabled little perception of functions.

In addition to setting out the administrative staff offices associated with building construction and maintenance

in school systems, the information returned by some systems revealed the numbers of personnel controlled by them. It also revealed that the numbers of these personnel increased with the size of the system, as might have been expected.

In system 1168, two engineering assistants were employed. System 2006 employed four drafting office staff in its architectural department, and eight tradesmen in its building and maintenance department. System 2797 employed ten architectural staff, four clerks of works and nine trades supervisors. No evidence about such personnel was available from system 3099.

The result of these considerations was that, in systems up to 1107, the consistent appearance of building and maintenance offices began with system 321, and was limited to one such office. Two offices occurred at system 1107, and four at system 1168. With system 2006 and larger systems, staffs with more than four offices were usual and a wide diversification of functions related to the operations of the department was revealed by their titles.

Additional Offices

Caretaking Services. Included in four of the six larger systems was an office which could be entitled, as in two of the systems, supervisor of custodial services. It occurred first in system 1107, and recurred in all systems except two. The exceptions were, system 3020, in which

the staff of the non-instructional side of operations was smaller than in systems of similar size, and system 2006, which, however, had an office of the Building and Maintenance Department designated as Deputy Assistant Director (Plant operation) which may have supplied the deficiency.

Stores. Three of the systems showed the occurrence of an office in charge of stores. The systems, and the specific offices named by them can be shown thus:

System 1186	Stockroom Keeper (no other personnel indicated)
System 2797	Stores Clerk (plus 7 men employed as storemen or store-keepers)
System 3099	Director of Purchasing and Stores Warehouse Manager Assistant Warehouse Manager (no other personnel indicated)

VI. SUMMARY OF FINDINGS OF CHAPTER

This chapter has been devoted to the identification of the size of systems at which the various administrative offices began to occur consistently, when the systems were ranked in increasing order of size.

Consistency of occurrence was determined by inspection and was taken to mean the appearance of the office in

every second system, or the maintenance of a mean occurrence in at least fifty per cent of systems with each successive system past a selected point.

Some offices did not appear consistently in the ranked systems of the sample and thus it was impossible to establish threshold sizes for them. All that could be said in these cases was that they occurred first between two specified sizes of systems.

A partial summary of the results of the analysis carried out in the chapter is presented in Table XX. In this table, school system operations were divided into three parts, namely; Instructional, Business, and Building Construction and Maintenance. The Instructional division was further subdivided into the major tasks carried out in this aspect of the work of a school system.

A discussion of the findings under the headings recognized in Table XX was adopted as a means of summarizing the work done in this chapter.

Elementary and Secondary Education

The first line officer to appear after that of the superintendent was one that exerted control over elementary education. The office represented the first differentiation of line function within the administration of a school system, and its first sign of departmentalization.

TABLE XX

THRESHOLD SIZES FOR ADMINISTRATIVE STAFF OFFICES

Administrative Staff Office	Size of System
<u>INSTRUCTIONAL</u>	
<u>Elementary Education</u>	
1st office	128
2nd office	1107
3rd office	2006
4th office	2977
<u>Secondary Education</u>	
1st office	446
2nd office	1107
3rd office	2006
4th office	2977
<u>Vocational Education</u>	
1st office	1168
<u>Supervisors</u>	
1st and 2nd Office	100
3rd office	248
4th, 5th, 6th, and 7th offices	698
8th to 19th offices	2006
<u>Consultants</u>	
1st	342 [*]
2nd and 3rd (Irregular, supplementary to supervisor)	361
4th to 6th	2977
Adult Education Director	743
Library Officer	275
Instructional Materials Officer	Between 321 and 698 [*]

^{*}Not proven

TABLE XX (continued)

Administrative Staff Office	Size of System
PUPIL PERSONNEL SERVICES	
1st office (usually director of guidance)	247
2nd office (usually director of special services)	1168
3rd office	1168
4th and 5th office	2977
Tests and Measurement Officer	743
ASSISTANT SUPERINTENDENT (not controlling specific department)	699 to 1026 (1026 may be upper limit)
BUSINESS	
2nd office (usually accountant)	227
3rd office (usually 2nd accountant or assistant secretary-treasurer)	342
4th office	1168
Purchasing Officer	Between 321 to 743
Buyer	1168
Stores Office	1168
BUILDING CONSTRUCTION AND MAINTENANCE	
1st office	327
2nd office	1107
3rd and 4th office	1168
5th and 6th office	2006
Custodial Services	1107

The title to the office usually linked it clearly to its task of direction of elementary education but in a number of systems the office bore the title of assistant superintendent. The threshold for this office was suggested as 128.

For secondary education, the establishment of a controlling office first took place in larger systems than for elementary. The threshold of size for such an office appeared to be 446.

The occurrence of additional administrative offices in both elementary and secondary education was similar. In both, a second administrative officer occurred at size 1107, a third at 2006 and a fourth at 2977.

Other offices directing a portion of the instructional programme were found in vocational education and adult education. A director of adult education appeared in the latter half of medium sized school systems, and appeared to have a threshold size of 743. The subsequent occurrence of the office in the systems of the sample was not consecutive, save among the very largest systems.

A director of vocational education appeared only in the larger systems and a threshold size of 1168 is suggested for the office. Smaller systems appeared to appoint only supervisors of this field of instruction.

Supervisors and Consultants

The office of director of elementary education was spoken of as the first line office after the superintendent, to appear in the administrative staff offices in school systems. However, the first administrative staff office to occur was usually that of supervisor of a subject area or grade level, whose position was staff rather than line. First and second supervisors occurred together in system 100 and appeared consistently in subsequent systems.

Following the definition, the term consistent could not be applied to the occurrence of the office of third supervisor until system 248. This office appeared first in system 100, but including this appearance, appeared only three times in seven systems up to 248. From this system onward, it was consistent in occurrence.

The fourth supervisor's office did not occur consistently until system 743, with which the fourth, fifth, sixth, and seventh supervisors began to occur consistently. That is, three supervisors were found in systems between 248 and 743, and beginning with system 743, seven supervisors consistently appeared in each system until 2006. In this system, nineteen offices of supervisor occurred, a fact which could be observed in three of the four largest systems. The office of supervisor of subject area or grade

level was thus one of the most numerous found in the school systems of the sample. In these systems, the number of times which the office occurred in each did not increase regularly as the size of system increased. Instead a similar sized group of supervisors was maintained over a wide range of sizes up to a certain point, when a much larger group of supervisors was appointed. This number of supervisors similarly was maintained over a sequence of larger systems until once again a much larger group of supervisors was established.

The office of consultant was generally quite irregular in occurrence, except for the first one, which appeared consistently in systems from 342 onward. In systems up to 1026, the offices of second and third consultant occasionally occurred, but their appearances were not consistent. In systems larger than 1026, the office was more numerous, with six or more appearing in four of the six systems. System 3020 had fifteen consultants, which was an unusually large number for this sample of systems.

Pupil Personnel Services

Offices concerned with the administration of pupil personnel services first occurred with system 247, and thereafter appeared consistently. In the smaller systems in which the office occurred, the title usually found for

it was that of supervisor of guidance. In the majority of cases, however, these systems also employed on the central office staff, several of such personnel as psychologists, social workers and/or counsellors who appeared to be under the line control of the guidance officer. For this reason, the supervisors of guidance, where so named, were placed in a category separate from supervisors of subject areas and grade levels.

The single office directing guidance services occurred in systems from 247 to 1168, in which a wider set of offices appeared. Three offices dealing with counselling, guidance, and special education appeared in this system.

This pattern was repeated in subsequent systems with some variations. With systems 3020 and 3099 the number of administrative staff concerned with these services increased strongly.

In guidance and associated services, threshold for an office in charge appeared to be 247. For the second and third office, it was 1168. For an organized department with five administrative staff and a large number of specialist pupil personnel workers under the control of a senior officer of the system, the threshold was 3020.

Assistant Superintendent

If this is considered a senior administrative office in the system, not concerned with the administration of a particular department, such as elementary education only, then its occurrence must be considered irregular.

It appeared consistently from system 698 to 1026, inclusive, then disappeared, only to reappear with the largest system, 3099. In the medium sized systems, the threshold for the office appeared to be 698.

Other Offices

A Tests and Measurements officer, often called a psychometrist, appeared in half the systems beginning with 761, which could be called the threshold of system size for it. It should be noted that this office was included among the offices of pupil personnel administration in two systems. Library officers appeared consistently, though not in all systems, beginning with system 275. The office of supervisor of instructional materials occurred three times between systems 321 and 698, but its occurrence was not consistent, either in this group of systems or later, so that no threshold size could be established for it.

Business Offices

The first business office established with each system was that of the secretary-treasurer.

In the sample of systems, the second business office established was usually that of an accountant, which occurred with system 227, though in one system the second business office was that of assistant secretary-treasurer. The third business office occurred consistently with system 342, and was either that of a second accountant or an assistant secretary-treasurer.

With system 1168, however, at least four offices were established and appeared consistently thereafter. These offices could be identified as:

Secretary-treasurer

Assistant secretary-treasurer

Chief accountant

Assistant accountant or payroll accountant

Threshold sizes in this division then were 227 for two offices, 342 for three for three, 1168 for four.

Purchasing officers did not appear consistently until system 1107, though they showed irregular appearances between systems 321 and 743. A threshold for a second purchasing officer appeared with system 2006. The largest system of the sample had these officers associated

with a staff of buyers. An office in charge of stores appeared with system 1168.

Building Construction and Maintenance

The threshold for the first office concerned with buildings and maintenance appeared to be 321. A second office was not established until 1107 but after this there was a rapid addition of a third and fourth office in 1168.

Subsequent systems added another on or two offices, so that 2006 could be called the threshold for the fifth office of this aspect of operations.

It was notable that with the larger systems the titles indicated a more specific task allocated to each officer, whereas earlier, generalized names had been used. For example, with system 2006 an office of architect appeared consistently.

From the evidence tendered here it can be said that, in the sample used for the study, an order of appearance could be established among the administrative staff offices identified in the school systems in the sample, and that the majority of the offices could be assigned a threshold size for the occurrence of each in the systems of the sample.

Conclusion: Hypothesis two is therefore accepted.

CHAPTER VI

SUMMARY AND CONCLUSIONS

VI. REVIEW OF THE PROBLEMS

The purpose of this study was to examine the relationships between the size of school systems and certain characteristics of their administrative staffs. The characteristics which were examined were, first, the proportion of administrative staff in the school system, and, secondly, the initial consistent occurrence of each of the administrative offices when systems were ranked in order of size.

The school systems, upon which the study was based, were relatively discreet, and not subject to a close external control in the matter of appointment of administrative staff. They were very largely autonomous in the matter of administration, and external authorities did not provide staff to bear the responsibility for any substantial area of administration within them. The systems varied in size and in numbers of administrative staff. Most of the largest systems in each of the western provinces were represented, as well as systems with the minimum numbers of administrative staff. The systems were predominantly

urban in character, and each one administered both elementary and secondary education.

Thirty-eight school systems in the four provinces of Western Canada responded to a request for information on which the study was based. Each school system supplied data of two kinds. These data were, first, a list of their central office staff, and, secondly, the numbers of their pupils, schools, and personnel employed in various categories in their schools. The size of each system was defined as the sum of the numbers of personnel employed by the school system in specified categories. These categories were the certificated personnel, including principals, employed in schools, and the personnel employed in the central office, either in an administrative or professional capacity. Administrative staff were identified as being those who made key organizational decisions and/or carried out direct interpersonal supervision of other personnel but who did not enter into direct relationships with pupils as a major part of their work. The total administrative staff consisted of central office personnel who were categorized as having administrative functions, that is, central office administrative staff, and principals of schools.

Hypothesis One

Under this hypothesis, the problem was to find

whether the number of persons categorized as administrative staff in school systems increased in proportion to the total size of the system, or whether, as was hypothesized, the proportion of administrative staff decreased in successively larger systems.

Hypothesis Two

With the second hypothesis, the problem was to identify the order of appearance of each administrative office among systems ranked in order of size, and to establish the size of the system at which the office began to appear consistently. For the purposes of the study, consistent appearance was defined as appearance in fifty per cent of cases in successive school systems. The size of system with which consistent appearance began was identified as the threshold for that office,

VII. SUMMARY OF FINDINGS

Hypothesis One

A significant correlation was found to exist between the size of the school system and proportion of administrative staff. The Pearson product moment correlation coefficient between these two variables was $-.5173$. This was above the correlation of $.409$ required for significance at the $p .01$ level. A significant

correlation of $-.417$ was also found between the size of the school system and the proportion of central office administrative staff. The fact that the correlations were negative indicated the relationships between the sizes were inverse, that is, the larger the school system was, the smaller was its proportion of administrative staff to total staff.

When systems were grouped together in categories, as small, medium, or large systems, and the mean percentage of administrative staff calculated for each group, it was demonstrated that the groups of large systems had a smaller mean percentage administrative components than the group of medium-sized systems, which in turn had smaller mean percentage administrative components than the smaller systems.

The relationship between the size of the system and the proportion of administrative staff was illustrated in another way by the regression equation, $x = e^{12.9-.782y}$, where x represents the size of the system and y represents the proportion of administrative staff.

Hypothesis Two

The individual offices of the administrative staffs of each school system were listed. Since differences in nomenclature were found for many similar offices, a

uniform categorization was applied to them. The frequencies with which the various offices thus categorized occurred in the systems of the sample were obtained.

A tabulation was then made in which the school systems were ranked horizontally in order of size, and administrative offices were ranked vertically in order of frequency. This enabled the system size at which each office began to appear consistently to be determined. This system size has been referred to as the threshold size for each office. The threshold sizes as identified in this study are set out in Table XX, on page 91.

VIII. DISCUSSION OF THE FINDINGS

The finding associated with the first hypothesis namely, that the proportion of administrative staff in school systems decreases with the size of the system, enables comparisons to be drawn between this and certain studies which were discussed earlier in the work.

Terrien and Mills say that the findings of their California study indicate that the school administrator may expect that the percentage of his organization which is devoted to administrative tasks will rise as his organization grows. It appears from the present study, however, that the school administrator in the four

western provinces of Canada can expect a decrease in the percentage of his organization which is devoted to administrative tasks as his system grows. The differences between the findings of the studies are best illustrated by a comparison of Tables I and XVIII.

The reasons for the differences may lie in the use of different criteria for the selection of administrative personnel. If Terrien and Mills included in their administrative components, personnel who were regarded as non-administrative in the present study, then the proportions of administrative staff could be significantly altered. Indik suggests in fact that Terrien and Mills did include staff non-supervisory personnel in their administrative component. (p. 309)

If this were true, then proportionately greater increases in the sizes of administrative staff of larger systems could be expected, since these systems obviously have more staff non-supervisory personnel. The derivation of the regression equation $x = e^{12.9 - .782y}$, enabled some comparisons to be made between the findings of the present study and those of Indik's study. In the latter, expressions were derived for the relationship between organization size and supervision ratio for five sets of organizations. These expressions were plotted on a semi-logarithmic grid so that the curves were reduced to

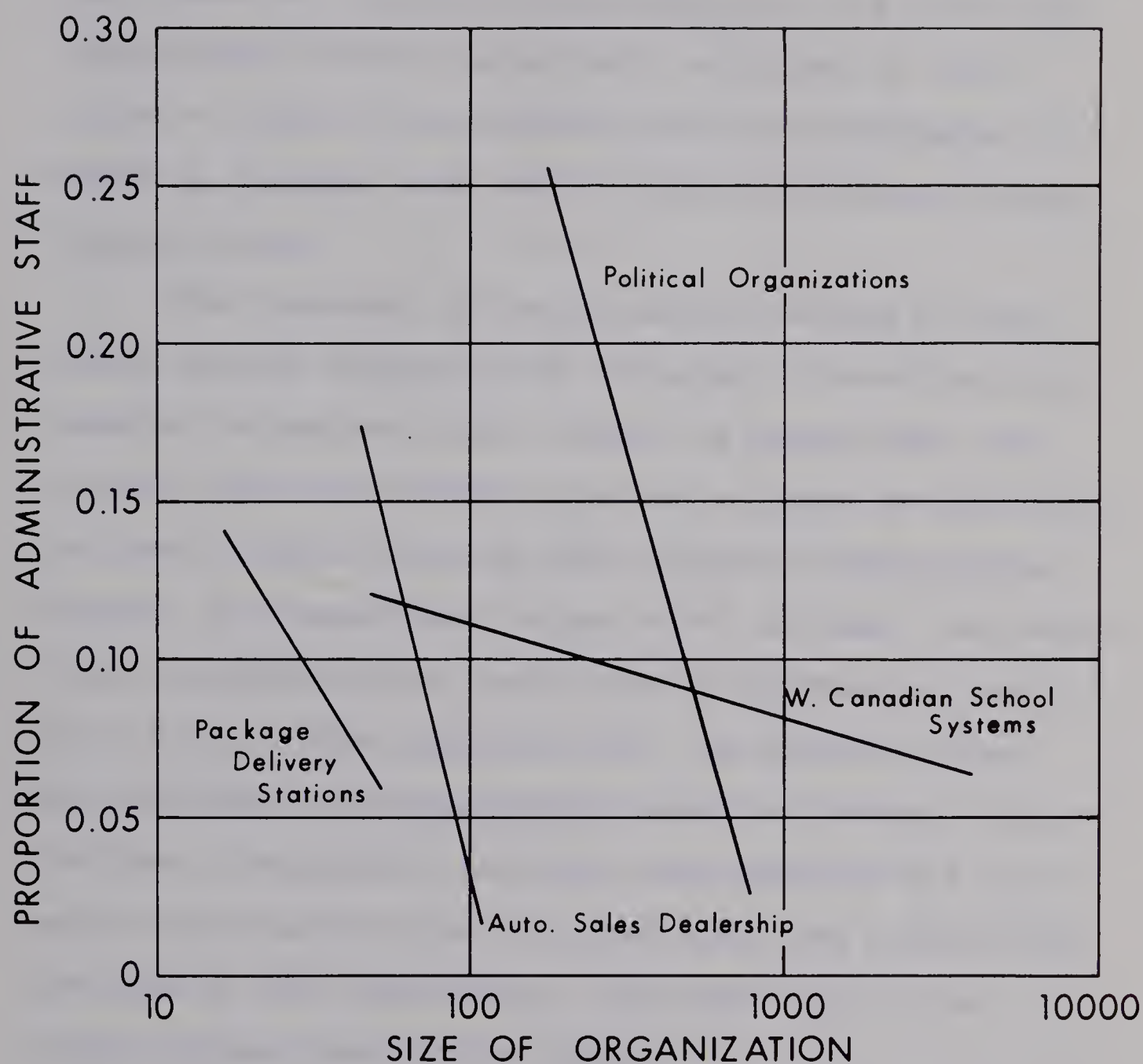


FIG. 3 RELATION OF ORGANIZATIONAL UNIT SIZE TO PROPORTION OF ADMINISTRATIVE STAFF FOR FOUR SETS OF ORGANIZATIONS

straight lines. It was suggested that the placement of the lines representing the expression for each organization showed an essential relationship "to the amount of interpersonal control potentially exercised by supervision." Three of these expressions are represented in Figure 3, together with that derived for Western Canadian school systems.

The placement of the expression derived for the school systems suggests that the amount of administration required in smaller school systems is larger than that required in larger systems, but not as large as that which is found in small units of other kinds of organizations. However, in successively larger school systems, the proportion of administrative staff does not decrease as rapidly as it does in other organizations. As Figure 3 shows, the proportion of administrative staff of package delivery stations, non-partisan political organizations and automobile sales dealerships decreases much more rapidly with the size of the organization, than does that of the school systems used for the study.

The proportion of administrative staff in the school systems of the sample used is smaller than that in certain other organizations when all the organizations are small. This proportion decreases much less rapidly

in the school systems than in the other organizations.

The findings of Anderson and Warkov, in their studies of the ratio of administrative staff numbers to size of organization in hospitals, are similar to those of the present study. The proportions of administrative staff in the two types of organizations differ, though not markedly, with the proportions in school systems being lower than those in hospitals. However, the decrease in proportion of administrative staff with size is of a similar order in the two types of organizations.

A further point made by these two writers may be considered here. In discussing their findings, they suggest that the relative size of the administrative component increases as the number of places at which work is performed increases. This suggestion does not appear to be borne out by the evidence of this study. In the study it could be proved that the increasing size of school systems is directly associated with an increasing number of schools, yet the correlation between the size of the system and the proportion of the administrative staff has been shown to be negative. The number of principals in a school system is one of the most evident attributes of the number of places at which work is performed.. However, as has been shown in the study, the inclusion of the principals in the administrative

component of a school system has the effect of making the correlation between size of system and proportion of administrative staff more significant than their omission.

The findings of the second part of the study, that there appeared to be a certain order to the appearance of administrative offices in school systems and that the consistent occurrence of specific administrative offices appeared to be associated with certain sizes of school systems, apply only to the sample of school systems used in the study. It is not suggested at this time, that the findings of the study have general validity for all school systems.

There are, in addition, some gaps in the upper section of the sequence of systems which might have affected the determination of threshold sizes for certain offices. Additional information may have placed some thresholds lower than was indicated in the study. The study shows that there were evident tendencies to uniformity in the creation of administrative offices in the school systems of Western Canada. The establishment of the fact of consistent appearance for almost every administrative office bears out this point. However, irregularities in the appearance of many offices were

also observable. Although it was possible to establish a threshold size of system for the consistent appearance for most of the offices this rarely meant that each office appeared in every system over a certain size. The early appearance of some offices in an irregular fashion was also notable.

The reasons for these irregularities may lie in the differences of views held by those who are responsible for decisions to create new administrative posts, or, alternatively, in the differing educational needs of the various systems.

IX. IMPLICATIONS OF THE FINDINGS FOR PRACTICE

If it is generally true that larger school systems have smaller proportions of administrative staff than smaller systems, then any charge that large systems are over-bureaucratized appears to be unfounded, at least on the argument of numbers.

The decreasing proportion of administrative staff in school systems may result from the degree of specialization which is possible with large organizations. The increased capacities which specialist officers bring to bear upon increasingly delimited areas of operation may enable them to treat with more subordinates than is

otherwise the case. In larger systems, also, subordinates may be more specialized in their functions, and more capable. These factors would tend to increase the span of control of each administrator, which would in turn account for the lower proportion of administrative staff in large systems. The analysis of data in support of the second hypothesis appears to suggest that there is a greater degree of specialization in larger systems.

Under these circumstances it is probable that the type of control exerted by administrative personnel in larger systems differs from that exerted in smaller systems. Thus the professional and personal capacities required of people occupying administrative posts may differ with the size of the systems. Administrators may need to bear this factor in mind in the selection of persons and in the drawing up of job specifications for administrative offices.

The findings of the second part of the study, as was pointed out earlier, apply only to the systems of the sample used. The study was not a normative one, so that the findings were not put forward as defining what should occur in the staffing of the administrative component of school systems.

The listing of the offices which were found in school systems, their categorization, and the establishment

of frequencies of occurrence and the threshold sizes could provide a basis for comparison of the staffing of administrative components of systems. While the staffing of any system must depend upon the specific and possibly unique needs of that system, the information provided by the study may serve as additional evidence upon which to take action about administrative appointments.

X. RECOMMENDATIONS FOR FURTHER STUDY

The basis of the present study lay in its identification of administrative staff according to certain criteria which were adopted from the literature. If valid comparisons between the findings of this study and those of studies of other organizations are to be made, a comparison between the nature of the administration in different types of organizations, and hence between the criteria for selection of administrative from non-administrative staff needs to be made.

The nature of authority relationships in school systems could be further examined in order to test more fully the criteria used in the present study for the identification of administrative staff. The exact nature of the control or authority exerted by the various offices identified in the present study obviously varies. If the types of authority exerted by each office were identified,

the nature of administrative tasks and relationships in school systems might be seen more clearly.

Central office clerical staff, the staffs of stores, drawing office, and transport sections were all omitted from the considerations of the study, yet their numbers, and the tasks in which they are employed undoubtedly bear a relationship to the size of the system. An investigation of this aspect of administration may be fruitful for practice, since it is an area of continuing concern for administrators and school boards.

The cross sectional nature of the present study suggests that there would be value in a longitudinal treatment of the same topic. Case studies of the growth and development of school systems should provide useful insight into the reasons for the establishment of specific administrative staff offices. The relationship between size and the occurrence of an office might then be more clearly understood. In addition such studies could lead to the establishment of true growth curves for school systems. This would provide a useful basis of comparison between school systems and other types of organizations.

CONCLUSIONS

For the urban school systems in the four western provinces of Canada, the following conclusions are

presented.

1. The larger the size of a school system, as judged by the total number of persons employed in professional and administrative tasks within it, the smaller is its proportion of administrative staff.

2. Most of the administrative staff offices found in school systems occur in an observable order in systems which are ranked in order of increasing size, and the consistent occurrence of each office begins with a specific size of system.

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A P P E N D I X

APPENDIX

6, 13134 - 114 Avenue,
Edmonton, Alberta

The Superintendent

Dear Sir:

I am at present engaged in graduate studies in educational administration at the University of Alberta, while on leave from my post as inspector of schools with the Education Department of Victoria, Australia.

I am concerned with research into the way in which administrative and supervisory staffs have developed in Canadian school systems, and hope, by means of an investigation, to establish a relationship between the size of a school system, and the number and type of administrative personnel employed. If adequate data can be obtained, I hope also, to establish the category of size of school system at which it is usual to find specific posts being filled.

The information sought is, firstly, data on the size of your school system as indicated on the accompanying sheet, and secondly, the number, and the positions, of the

administrative or supervisory staff within it. This list is meant to include the names of all the offices, or duties, of those who are employed by the school system to provide administrative, supervisory, or consultative services. Thus it would include the following positions, together with the number of persons in each:

Superintendents, Assistant Superintendents,
Secretary-treasurers, Accountants,
Directors of Branches, Assistant Directors,
Registrars,
Supervisors, Subject Consultants, Advisors,
Special Services Personnel, Psychologists,
Guidance, Welfare and Truant Officers,
Program and Curriculum Assistants, or Officers
or Supervisors,
Research and Development Officers and
Assistants,
Library Officers,
Staffing Officers,
Legal Officers, School Architects, and/or
Engineers,
Principals, non-teaching Vice-Principals and
members of school staffs who are released
part-time to undertake particular tasks on
behalf of the school system on a regularly
scheduled basis. Such people, or positions,
might be shown fractionally.

Obviously the above list is not exhaustive, but it

may help to identify those positions required for the study. It was originally intended to provide a check-off list of all positions likely to be found in a school system, but the differences in nomenclature between provinces, and even between systems, made this impractical.

Those who are not to be included on the list of administrative staff, are teachers, school librarians, school guidance officers, non-professional and clerical staff. Clerical staff and non-professional staff attached to central office should also be omitted.

A stamped, addressed envelope is enclosed for purposes of reply.

Yours sincerely,

.

DATA ON SCHOOL SYSTEM, 1966-67

NAME OF SCHOOL SYSTEM _____

1. Number of Schools

Elementary Schools	Junior High Schools	High Schools
-----	-----	-----
Elementary-Junior H.S.	Junior H.S.-Senior H.S.	Elementary Junior-Senior H.S.
-----	-----	-----

2. Number of Pupils

Grades 1 - 6	Grades 7 - 9	Grades 10 - 12
-----	-----	-----

3. Number of Classes

Grades 1 - 6	Grades 7 - 9	Grades 10-12
-----	-----	-----

Special Classes (Opportunity, Pre-employment, etc.)

4. Number of Teachers

Grades 1 - 6	Grades 7 - 9	Grades 10-12
-----	-----	-----

Data on this page will be used for correlation with size and categories of administrative staff and so is essential to the project. It is possible that, in some instances, school organization will not permit information to be supplied in the above form. Please feel free to give data in a form convenient to your own system.

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